▶ DATA STRATEGIES

MCI charting new packet net course

Shift from public to private offerings eyed.
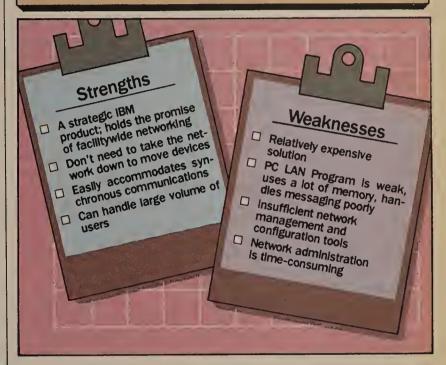
BY PAM POWERS
Senior Editor

WASHINGTON, D.C. — MCI Communications Corp. may soon abandon its floundering DataTransport public packet-switching network business in favor of building private packet nets, *Network World* has learned.

MCI said it would make an announcement regarding its DataTransport network service in two weeks, but refused to specify the exact nature of the plans. Bob Yundt, director of data communications services at MCI, hinted that the company would pull out of the public packet market and sell private packet networks, perhaps in conjunction with an equipment vendor.

Analysts said DataTransport has fallen
See **DataTransport** page 35

Users rate IBM's Token-Ring Network

Strengths
- ☐ A strategic IBM product; holds the promise of facilitywide networking
- ☐ Don't need to take the network down to move devices
- ☐ Easily accommodates synchronous communications
- ☐ Can handle large volume of users

Weaknesses
- ☐ Relatively expensive solution
- ☐ PC LAN Program is weak, uses a lot of memory, handles messaging poorly
- ☐ Insufficient network management and configuration tools
- ☐ Network administration is time-consuming

FEATURE FOCUS

New management needed for the multiuser PC data base

Software tool expands PC net possibilities.

BY MIKE POPE
Special to Network World

For many personal computer users, data base management systems (DBMS) have become as essential as hammers are to carpenters. But although these systems offer departmental system users independence from the MIS department, they do not offer the advantages of centralized DBMS common on minicomputers and mainframes.

One of the most touted developments in personal computer software has been the expansion into multiuser applications that run on local-area networks. The latest offerings from major DBMS
☞ See **Building** page 31

▶ LAN REPORT CARD

Hopeful users face Token-Ring limits

BY MARY PETROSKY
West Coast Correspondent

Lured by IBM's promise to provide connections to a wide range of systems, corporate users have embraced the IBM Token-Ring Network, despite the shortcomings of its operating software and network management tools.

Many users are betting IBM has what it takes to make facilitywide networking a reality. IBM has already announced Token-Ring connections for its 3174 cluster controller, and its 3725 and 3720 front-end processors, al-
See **Token** page 6

NETWORK LINE

News

Recent tariff turmoil will compel some AT&T users to re-evaluate their mix of phone services in order to stay both penny- and pound-wise. Page 2.

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The MAP/TOP Users Group will team up with the Corporation for Open Systems and large users for tests aimed at speeding the advent of Manufacturing Automation Protocol/Technical and Office Protocol-compatible products. Page 2.

▼

The General Services Administration airs the formal request for proposal for the FTS 2000 mega network, and US Sprint and Electronic Data Systems jointly announce plans to enter the bidding fray. Page 2.

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Disgruntled user Atlantic Electronics and Telecommunications, Inc. files suit against Mitel and distributor Introlink, claiming that Mitel's SX-2000 PBX "never performed as promised." Page 4.

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Long-haul carrier Argo Communications is on the ropes as failed merger negotiations — combined with heavy capital losses — knock it into seeking Chapter 11 status. Page 7.

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AT&T's long-distance service standby, WATS, stands to lose some of its subscribers due to rate cuts that have made another AT&T service option, Pro America, more cost-attractive. Page 9.

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Features

Communications managers working in a multivendor environment need to be warned: Implementing a T-1 network can produce a tangled web of vendor finger-pointing. Page 28.

NEWSPAPER

▶ SMALL SWITCH MARKET

AT&T renovates low-end strategy

GBS's Blanchard dispels rumors, outlines plans.

BY JIM BROWN
New Products Editor

Squeezed by increased competition, stale market conditions and corporate austerity, AT&T's General Business Systems (GBS) unit is rethinking the way it serves the two-to-80-line business equipment market, which constitutes 90% of U.S. businesses.

"It's time to streamline, load our guns and do even better than we have heretofore," GBS Vice-President Gus Blanchard told *Network World* in the first interview he has granted since taking over his post in June.

Industry insiders say the narrow profit margins of the low-end equipment sold by GBS has made it increasingly difficult for AT&T to maintain a direct sales force in this market. Speculation abounds that GBS is readying to cast
See **Blanchard** page 39

▶ SERVICE SHUFFLE

Users mull options on heels of AT&T rate cut

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Communications managers are happy about AT&T's recent $1.85 billion rate cut, but many may be forced to reshuffle their service portfolios to get the greatest benefit from the new tariffs.

While the cost of switched services fell, AT&T private-line rates are expected to rise as early as Feb. 1. This could force users who rely heavily on private lines for voice service to migrate to AT&T's virtual private networks.

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Most observers expect AT&T's private-line rates to increase by 2% to 3%. That is less than the 3.3% increase AT&T sought in its original private-line tariff filed with the Federal Communications Commission in November. Implementation of the new private-line tariffs was deferred pending FCC review of local exchange carrier access rates. Lower access rates were approved by the agency on Dec. 31, and AT&T is expected to file new private-line tariffs with the FCC this week to reflect those rate cuts.

"Local exchange carriers were asking for increases that the FCC denied because they were not based on the cost of providing special access," said John Cimko, chief of the FCC's tariff division. "Several of the BOCs wanted to increase special access rates to discourage high volume usage of private-line service and encourage usage of switched service. We wouldn't allow this because it's strategic pricing to manipulate the market."

New WATS, Megacom, Megacom 800 and Pro America rates took effect Jan. 1. Megacom declined 6.5% and Pro America rates were chopped between 12.5% and 13.2%. But WATS rates decreased only an average of 4.4%. WATS customers who have over 80 hours of usage a month (per line) will experience an 8% to 10% rate increase due to AT&T's restructuring of the tariff, said Robert Ellis, president of the Aries Group, Inc., a consulting firm in Rockville, Md.

Thus, changes in WATS pricing could make Pro America services more attractive to some users. (See "Pro America earns new look," page 9.)

"The restructuring will yield an overall reduction in WATS rates, but in certain categories such as the medium- to high-volume range, rates will increase," Ellis said. "The greatest benefit will go to the low-volume WATS user. AT&T is being threatened by competition in this market segment and these price cuts are AT&T's response," Ellis said.

Kenneth L. Phillips, chairman of the Committee of Corporate Telecommunications Users and vice-president of telecommunications policy at Citicorp in New York, said of AT&T's price cuts, "We're seeing prices move more toward cost,

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▶ FTS 2000

Sprint/EDS join bidding

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The General Services Administration (GSA) last week issued the formal request for proposal (RFP) for the $4.5 billion Federal Telecommunications System (FTS) 2000, an all-digital network estimated to save the government $100 million a year when complete.

Soon after the RFP was issued, Electronic Data Systems Corp. (EDS) and US Sprint Communications Co. joined forces to bid for the 10-year contract. EDS will serve as the prime contractor, with US Sprint providing switching and transmission services through its digital, fiber facilities.

At a press conference Friday, the companies said they would jointly coordinate network design. EDS would develop specialized software, such as billing software, for FTS 2000 and would develop and maintain a network control center.

The EDS/US Sprint team is the third major alliance to announce intent to bid for the FTS 2000 contract. It will compete against AT&T, which has joined forces with Boeing Computer Services Co., and a coalition including Martin Marietta Corp., MCI Communications Corp. and Northern Telecom, Inc.

The RFP marks the culmination of two years of planning and is the largest-ever competitive bid of its kind, GSA officials said. The RFP calls for a prime contractor, with a team of subcontractors, "to design, implement and maintain a state-of-the-art telecommunications system for the federal government."

Implementation of the FTS 2000 network is scheduled to be completed in 1990. Bids are due in June 1987, and a final contract will be awarded in December 1987, according to GSA Administrator Terence

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▶ PROTOCOL TESTS

MAP/TOP users ally with COS

Joint effort formed for MAP 3.0 testing.

BY BOB WALLACE
Senior Editor

PHOENIX — The MAP/TOP Users Group has enlisted the aid of the Corporation for Open Systems (COS) and several large users in an expanded testing program designed to speed the introduction of products compatible with the Manufacturing Automation Protocol/Technical and Office Protocol.

The MAP/TOP Users Group is expected to announce tomorrow at its winter meeting here that it has joined forces with COS to develop a MAP/TOP conformance test for the yet to be released MAP Version 3.0 specification. *Network World* has also learned that the U.S. Air Force, Aluminum Co. of America, Boeing Computer Services Co., Deere & Co., General Motors Corp. and TRW, Inc. will volunteer their facilities for use in MAP/TOP product conformance testing. British Aerospace and the UK Department of Trade and Industry will host the same conformance testing activities in the UK. The announcements were seen as a boost to what many believe had been a stalled MAP movement.

The enlistment of the eight new firms will bring to 10 the number of MAP/TOP conformance testing centers in the U.S. and abroad, and reduce delays vendors now encounter in certifying product conformance to the MAP/TOP specification. Currently, only the Industrial Technology Institute (ITI), an Ann Arbor, Mich.-based network testing company, and the Fronhoffer Institute in Karlsruhe, West Germany, serve as conformance testing centers.

In a related announcement, the MAP/TOP Users Group and ITI are expected to announce at the meeting the availability of software that will enable vendors to test their products for MAP 2.1 compatibility.

The $20,000 package will include a site license for the conformance test software as well as a Sun Microsystems, Inc. Sun 3 workstation.

Numerous networking vendors, including Digital Equipment Corp., IBM, Industrial Networking, Inc., Concord Communications, Inc. and Honeywell, Inc., already offer network hardware and software compatible with MAP Version 2.1.

MAP is a suite of emerging and established standards designed to allow automated factory floor equipment produced by a variety of vendors to communicate over broadband communications networks. TOP is designed to provide

▶ HIGH-SPEED ASSISTANCE

Start-up firm uncovers controller for DEC users

BY PAUL KORZENIOWSKI
Senior Editor

HOLMDEL, N.J. — General Communications Corp. last week introduced a controller that overcomes wide-area communications bottlenecks by providing a direct interface between Digital Equipment Corp. processors and T-1 1.54M bit/sec digital communications facilities.

The start-up company's T100U communications controller is compatible with DEC's Unibus and Unix System V operating system. It includes an on-board digital service unit/channel service unit and conforms to AT&T's T-1 network specifications, including Extended Superframe and B8ZS line coding specifications.

T-1 link capacity can be channelized or used at the full 1.54M bit/sec bandwidth.

Chuck Kanupke, president of the young company, said that the T100U is intended to support bandwidth-intensive communications requirements, such as file transfers between engineering workstations and a DEC VAX or PDP-11.

"The problem of high-speed communications is starting to emerge for DEC users," he said.

Although DECnet supports local connections at 10M bit/sec over Ethernet, remote connections are limited to speeds up to 64K bit/sec. Some users have found that speed to be too low for certain applications.

The need for high-speed, bulk file transfers has been well-documented among mainframe users, but not everyone is convinced that

> **" The T100U is also reportedly designed to support ISDN standards as they become available. "**

minicomputer users have the same requirements.

Gerald F. Mayfield, vice-president at the Stamford, Conn., office of the DMW Group, Inc., said, "Transmission speeds of 56K bit/sec or 64K bit/sec will adequately support most DEC users. Only a user with a large processor, like a VAX 8600, would require T-1 transmission speed."

Kanupke said two companies have installed and are using the $4,950 T100U controller. The Unix V driver costs an additional $1,350.

General Communications intends to round out its product line in the next several months with the introduction of drivers for Berkeley Unix 4.3 standards and VMS/DECnet.

In addition to enhancing the product's data capabilities, the start-up company plans to add voice support to the controller. The T100U will be able to support Siemens AG's EWSD and AT&T's 4ESS and 5ESS central office switches by the middle of the year, according to the company.

The T100U is also reportedly designed to support Integrated Services Digital Network standards as they become available. An unused section of the add-on board is available for software that will support the lower three levels of ISDN standards. Kanupke said that the company plans to add IBM interfaces to the product by the end of the year.

General Communications currently has eight employees and is trying to fill a number of vacant positions. The company is also in the process of securing its first round of venture capital financing.

Kanupke came to General Communications from Dataquest, Inc., where he was a vice-president. Other key players at the company include two former AT&T Bell Laboratories engineers, Tibor Szekeres and Thomas Ballister, and Gary Stone, a former consultant. ☒

▶ SUIT AND COUNTERSUIT

SX-2000 user sues Mitel

BY MARY PETROSKY
West Coast Correspondent

SACRAMENTO, Calif. — Claiming Mitel Corp.'s SX-2000 private branch exchange "never performed as promised," a user of the company's first digital switch has filed suit against Mitel and the company that sold the switch.

Atlantic Electronics and Telecommunications, Inc., parent company of Regency Telecommunications and Technologies, filed suit in Superior Court here on Dec. 24 against distributor Introlink, Inc. and Mitel, claiming breach of contract, breach of warranty and the supply of defective equipment. Damages sought were not disclosed.

Michael Lavery, associate general counsel for Mitel, said last week the company was unaware it had been named in the litigation. Atlantic's legal counsel said Mitel had not yet been served with the suit.

Regency Telecommunications and Technologies, a shared tenant services provider, purchased an SX-2000 in February 1986, according to Rami Pillai, president of Atlantic Electronics and Telecommunications. Pillai contends that the software used to partition the switch into what would appear to be individual tenant switches never worked. In addition, trunk lines were periodically jamming, preventing their release after calls were terminated, and other features, such as call holding and call forwarding, also never operated properly.

Santa Clara, Calif.-based Atlantic received new software in June, but the problems persisted, Pillai said. In addition, Mitel promised Atlantic a $500,000 bond to guarantee the system's performance but never delivered the bond. Pillai contends that other contractual obligations, including on-site technical training, also were not met.

The SX-2000 is Mitel's high-end digital PBX, capable of supporting 5,000 lines, according to Joseph DiGraziano, product specialist at Mitel. Beta installations of the switch were begun in 1984, with full distribution beginning in 1985, DiGraziano said.

Mitel claims the SX-2000 can be software-segmented into 64 partitions for use in shared tenant service applications. DiGraziano estimates a dozen of the approximately 150 installed SX-2000 switches are using the shared tenant feature. He said he is unaware of any other major complaints about the switch.

Atlantic's legal action is a countersuit in response to litigation filed by Introlink for nonpayment. Pillai admits that he paid only $60,000 of the total $180,000 owed, choosing last June to withhold further payment until the system worked satisfactorily.

"We gave them nine months to fix it. We were willing to take back our money and give back the equipment," Pillai said.

Lavery said Mitel had earlier investigated Atlantic's claims and said, "all the features that are specified for the equipment were working. This is a collection dispute."

Introlink, a major accounts contractor for Mitel, was able to obtain a court order requiring Atlantic to hand over the SX-2000, according to Jeff Hanner, Introlink's controller. Atlantic has agreed to relinquish the switch, Hanner said.

"I have no comment other than we feel the suit has no merit," Hanner said. He would not say how many SX-2000s the company had installed, but said they had no other complaints about the switch.

Atlantic is itself an interconnect company and has sold Mitel's low-end PBXs for five years, Pillai said.

"We're not interested in litigation; that's why we kept quiet so long," Pillai said. "This is a particular case about a particular piece of equipment. It's a problem with software development, so if there's a problem, fix it." ☒

▶ MULTIPLEXERS

DCA, Cohesive venture bears first products

T-1 mux line now cheaper, more efficient.

BY PAUL KORZENIOWSKI
Senior Editor

ATLANTA — The first fruit of last summer's merger between Digital Communications Associates, Inc. (DCA) and Cohesive Networks, Inc. appeared last week in the form of a repackaged and more price-competitive Cohesive T-1 multiplexer line.

Previously, Cohesive offered two multiplexers, the CN-1, which could support 16 T-1 lines, and the CN-2, which could support 36 lines and a transmission speed of 45M bit/sec. The CN-1 had one shelf for interface cards and the CN-2 housed two shelves. Those two models now fall under the same name, the System 9000.

DCA also said it will offer a new, lower cost multiplexer interface card for the System 9000. The company's current board is used with both multiplexers but designed for use in fully configured devices that demand extra on-board resources. The new board, intended for use in multiplexers that support only a few T-1 links, will have less random-access memory.

Tench Coxe, System 9000 senior product marketing manager, said the older cards were expensive.

> **❝ The high price of the interface cards enabled other vendors, with lower prices, to beat out Cohesive for sales. ❞**

"The high price of the interface cards enabled other vendors, with lower prices, to beat out Cohesive for sales," he said. The new cards can cut as much as $3,000 from the price of an entry-level multiplexer.

In addition to cutting the price of the interface cards, DCA pared the cost of the multiplexer's network management system. The original system, which runs on an NCR Corp. Tower supermicrocomputer, costs $70,000. DCA now offers different versions of the product that start at $20,000 and increase with the size of a network.

DCA also added a version of the network management system that runs on Sun Microsystems, Inc.'s Model 3/52 or Sun 3/110 workstations. Prices for versions based on a Sun processor start at $15,000. Some users may prefer the Sun version because it operates with an icon interface and a mouse pointer, according to Coxe.

The new effort is expected to help DCA compete against vendors such as Timeplex, Inc., Amdahl Corp. and Avanti Communications Corp. in the middle ground of the T-1 multiplexer market.

DCA offers a point-to-point T-1 multiplexer, Netlink, for the low end of the market. That product was the result of an agreement that DCA signed with Scitec Corp. Coxe said that Scitec no longer receives any royalties from Netlink sales and DCA will continue selling the point-to-point multiplexer.

However, DCA will also modify the System 9000 offerings in an effort to make them more competitive in the low end of the market. Last fall, DCA began offering customers the opportunity to apply the purchase price of a Netlink toward the purchase of a Cohesive multiplexer and it appears likely that the company may eventually replace Netlink with the System 9000.

Analysts viewed the retrenchment as a clear indication of how quickly DCA exerted its influence over Cohesive. The decision to port the network management software was based in part on the fact that DCA engineers use Sun workstations. ▨

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the same capabilities over Ethernet-like local networks in technical and office environments.

The expansion of the conformance testing program is expected initially to benefit the MAP movement more than TOP because the factory specification is more fully developed than its office counterpart.

COS will assist the MAP/TOP Users Group in the development of a conformance test against which purported MAP 3.0-compliant products will be tested. The Vienna, Va.-based COS boasts 62 member companies, of which roughly 25% are users. COS was chartered in early 1986 to accelerate the introduction of interoperable, multivendor products and services based on international standards.

The new project will also lessen the burden of testing GM and ITI had shouldered for several years.

Expansion of the test program should help users by hastening MAP- and TOP-compatible products to market. Rigorous conformance testing at user sites will mitigate customer confusion about MAP/TOP product compatibility.

The announcement of the testing alignment follows the recent decision to postpone a demonstration of Version 3.0 of MAP/TOP originally slated for the November Autofact '87 conference in Detroit. One reason given for the delay was COS' inability to complete product conformance tests. Although some 50 vendors were to take part in the event, networking heavyweights DEC, IBM and Hewlett-Packard Co. had not committed to the demonstration when the delay was announced.

GM spokesman Mark Cocroft said the massive MAP/TOP demonstration, which is supposed to be twice the size of the Autofact '86 demonstration, will be held in Baltimore in the summer of 1988. GM and COS hail the creation of the testing arrangement as the last major hurdle before completion of MAP development.

Several users have created pilot MAP networks, and although there are already many MAP-compliant products available, few products are used in actual manufacturing applications.

Rapid development of conformance test facilities should also restart what industry watchers thought to be a stalled MAP movement. Charles Gardner, chairman of the MAP/TOP Steering Committee, said a polished MAP 3.0 conformance test should greatly assist vendors planning to build hardware and software that incorporates the factory communications standard. "The test will give the supplier community concrete goals for product development. We will have a fully developed design target for suppliers, which will remove a great deal of uncertainty from the product development process," Gardner added.

Products incorporating MAP Version 3.0 that have been conformance tested will be available in the not-too-distant future, Gardner predicted. "The completion of the MAP/TOP 3.0 test platform will permit MAP- and TOP-compatible products to be widely available in the 1988 to 1989 time frame." ▨

Washington Update

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — MCI Communications Corp. created a stir when it failed to disclose until last week that Chairman William G. McGowan had been hospitalized for a mild heart attack that occurred on Dec. 21. Company officials said the occurrence "was not sufficiently material to disclose to stockholders." Industry analysts argued that McGowan's ill health was a significant development that MCI should have made public.

McGowan last week was reported in stable condition at Georgetown University Hospital where he was admitted on Dec. 22. The heart attack reportedly occurred while McGowan was out of town. McGowan was expected to be released from the hospital late last week and indicated he will return to work. MCI President and Chief Operating Officer Bert C. Roberts is running the company in McGowan's absence.

■ Democrats in the U.S. House of Representatives last week introduced protectionist trade legislation (HR-3) that would require the executive branch to ensure that U.S. communications companies are accorded fair treatment in foreign markets. The bill covers both telecommunications equipment and services. It would allow the administration to order sanctions against nations that fail to allow U.S. firms entry into their markets. It would also empower the administration to negotiate agreements with other governments to give U.S. firms access to foreign markets. The fact that the legislation was introduced so early in the year (the 100th Congress convened Jan. 6) indicates it has some strong backing. But there are many opponents to protectionist trade legislation in Congress who would like to see the bill quashed.

■ The National Telecommunications and Information Administration (NTIA), a division of the U.S. Department of Commerce, said last week it has received some 1,300 pages of comments on its proposal to change telephone company rate of return regulations. The NTIA is responsible for developing such regulations, which the Federal Communications Commission and state regulators enforce within their jurisdications. Rate of return rules determine the amount of profit telephone companies such as AT&T and the Bell operating companies can earn and the amount they are allowed to charge customers for service. The NTIA believes that the telecommunications industry has outpaced the current rate of return regulations and that they should be changed. Many of those who filed comments suggested rule modifications designed to give telecommunications companies new incentives to innovate and keep costs down. State regulators argued the need to retain current rules as a means of curbing abuses by carriers.

Token from **page 1**

though none of these products have shipped yet. A Token-Ring Network to System/36 connection is due out in the second quarter.

The Travelers Corp. is betting heavily on the IBM Token-Ring to provide corporatewide connectivity. The Hartford, Conn.-based insurance giant has more than 30 Token-Ring Networks installed at various sites across the country and expects to have more than 200 in place by early 1988, according to Travers Waltrip, vice-president of data processing. The current networks range in size from 10 to 60 workstations.

Travelers is currently using gateways to connect Token-Ring Networks to corporate mainframes.

Each gateway consists of a dedicated IBM Personal Computer AT equipped with an IBM Synchronous Data Link Control card and IBM software. The company plans to connect its networks directly to 3725s and 3720s when these links become available.

A network analyst at a major California bank agrees that part of the Token-Ring Network's appeal is "the promise of a total connectivity solution." The bank currently has three Token-Rings that range in size from eight to 35 users. Gateways to mainframes are in use.

The analyst, who asked to remain anonymous, said a primary user concern about the Token-Ring is getting locked into using IBM equipment. "If we deviate from IBM's solution, we'd better be sure we're not cutting ourselves off from future connectivity," he said.

Development of third-party equipment to tie equipment from other computer makers to the Token-Ring has been stymied by a shortage of Token-Ring hardware.

IBM funneled most of its Token-Ring hardware directly to corporate users in 1986, leaving developers and resellers scrambling for network components, according to J. Scott Haugdahl, senior systems specialist at Architecture Technology Corp., a consulting and educational firm in Minneapolis.

Integrating Token-Ring Networks with existing networks is posing a challenge for some users. Wells Fargo Bank, N.A., headquartered in San Francisco, has a large installed base of Ethernet networks running Novell, Inc.'s Netware operating system, according to Steve Ikard, the bank's senior microcomputer consultant. The bank's three pilot Token-Rings use IBM's PC LAN Program. Ikard said he would rather not have to support multiple network operating systems.

Other than that, his one criticism of the PC LAN Program is that there is no "real messaging or mail."

Like many other users, Ikard rates network management as "extremely important, especially remote network management." And like many other users he says, "I haven't found anything that looks good so far."

Although IBM is expected to ship Netview/PC in the third quarter, Ikard isn't optimistic about the product. "Netview is repackaged mainframe network management tools," he said. "We've never had intelligent devices to manage through Netview. I hope IBM's addressing that in Netview/PC."

Ikard would like a network management tool that will let him control his network remotely. Rather than simply activating and deactivating devices, as Netview allows, he'd like to be able to query network servers, change network files, start and stop jobs, and do other functions that can be performed directly at a server. He said, however, "I'm not expecting Netview/PC to have any more functionality than Netview has now. I hope I'm proven wrong."

Network configuration and administration is the biggest problem of the Token-Ring for Ralph Sampson, director of the telecommunications department at McKesson Corp., a diversified company based in San Francisco. The telecommunications department has had a small pilot network up since last March running the PC LAN Program over existing 25-pair telephone wire. Users on the network swapped their 3278 terminals for IBM Personal Computers and were given access to the mainframe through a gateway.

Although generally happy with the network, Sampson said it occasionally crashes inexplicably. He suspects, however, that his network applications are to blame, not the network.

The biggest drawback to the Token-Ring is "the management and configuration of the whole thing. We only have seven PCs and trying to keep track of the network is an interesting job," Sampson said. That job, he said, requires full-time attention from one person.

Travelers' Waltrip said the Token-Ring's primary weakness is a lack of performance measurement tools. "We're working with IBM on that," he said.

Other users are not so kind in their description of the PC LAN Program's shortcomings. "It's a memory hog — we have no space in a machine to run applications," according to the network analyst. He also said the PC LAN Program does not allow individual users to set up a printer. ⊡

INDUSTRY UPDATE

US West to pull out of BELLCORE

In a Christmas Eve letter to Bell Communications Research, Inc. (BELLCORE) and the other six regional Bell holding companies, US West, Inc. said it intends to sell or otherwise dispose of its stock in the research consortium by Jan. 1, 1990. Observers say US West feels it may be able to use its research dollars better elsewhere. The company said BELLCORE needs to "develop and expand proprietary R&D activities for individual companies." US West will negotiate with BELLCORE over the next three years on continued participation in the consortium.

▶ CHAPTER 11

Argo files for bankruptcy

BY PAULA MUSICH
Senior Editor

NEW YORK — Long-distance carrier Argo Communications Corp. filed for reorganization under bankruptcy law in a federal district court here last week following the recent collapse of its planned merger with Litel Telecommunications Corp. and Microtel, Inc.

The failure of the Argo/Litel/Microtel merger, combined with significant losses, prompted Argo's major investors to refuse additional infusions of cash needed to sustain the ailing company. Those investors include telecommunications companies Centel Corp. and Alltel Corp.

Argo declined to comment on the filing.

A spokeswoman for Litel, based in Worthington, Ohio, cited the failure of the firms to agree on one condition of the merger for the collapse of the talks. None of the carriers would elaborate on that condition.

According to Linda Stokes, a consultant with TeleDesigns, Inc., an Atlanta, Ga.-based consulting company, the merger talks broke down at the last minute when Argo owners decided that the planned distribution of stock in the merged company was not acceptable.

Stokes, whose firm works with Argo, said Argo entered merger talks with another company following the quashed Litel/Microtel negotiations, but that deal fell through close to New Year's Eve. That was when the major Argo backers decided to refuse additional funding, she said.

Argo user Peachtree Surveys, Ltd., in Atlanta, Ga., was not surprised by the filing, nor was it concerned. Business Manager Richard Ebner maintained that Chapter 11 status will protect Argo from its creditors, allowing it to continue doing business while it reorganizes. "It happens [Chapter 11 filing] too often in that industry. I still look for them to be acquired or merged," he said.

Ebner said his company was satisfied with Argo's service, although the satellite-based network caused propagation delays in some calls. "Argo fit my regional calling patterns very well. The quality is not that great, but it's acceptable, and the price is right," he said. Argo currently carries 98% of Peachtree's voice traffic.

Stokes maintained that Argo is not a very desirable acquisition candidate from a marketing standpoint because of its use of satellite transmission. She feels the Chapter 11 filing is "an indication of trouble for the smaller long-distance companies. Acquisitions and mergers will be the rule of the day."

Argo reportedly owes AT&T $2.1 million and Nynex Corp. an additional $875,000. Argo also reportedly defaulted on a $200,000 payment to an arm of Citicorp on Dec. 31.

The financially troubled longhaul carrier, which boasted several hundred customers in 70 cities, was formed in 1981, Centel said. Argo developed a satellite-based network to pursue large-volume, private-line users, according to industry analyst Bill Reed of Link Resources Corp. in New York.

Reed maintained that the double whammy of increasing price competition and the high cost of constructing its own network proved too much for Argo. "Companies constructing their own facilities are really pinched by price cuts," he said.

Whether Argo's action signals the beginning of a shakeout in the long-distance carrier industry is a matter of debate. "There are 500 companies in the long-distance industry. This doesn't hold any lesson for what's happening with those remaining intact," said Jerry McAndrews, executive director of the Competitive Telecommunications Association in Washington, D.C.☑

▶ FINANCIAL FLUNK-OUT

Wang idles 1,000, cuts back on salaries by 6%

$35 million fourth-quarter loss expected.

BY NADINE WANDZILAK
Staff Writer

LOWELL, Mass. — Anticipating its second consecutive quarterly loss, Wang Laboratories, Inc. last week announced plans to lay off 1,000 workers and cut salaried employees' pay in an effort to reduce expenses by $50 million over the next six months.

The company reported a $30 million net loss for the quarter ending last Sept. 30, and it anticipates a loss of at least $35 million for the most recent quarter, which ended Dec. 31.

Wang Laboratories has cut its work force three times in the last 20 months by a total of 4,000, reducing its total number of employees to 29,000. The company expects to make the latest cuts by March 31. An estimated 400 jobs will be lost to attrition. Another 400 will be cut from field support, and the remaining 200 through the consolidation of customer service and manufacturing distribution.

Salaried employees will be subjected to a 6% pay cut, but will be

offered Wang Class B common stock to offset the reduction.

Company President Frederick Wang attributed the most recent quarterly loss to slower than expected sales of some key products. Details about what product areas might have caused the lower revenues were unavailable. A more detailed financial report will be released Jan. 20.

The company hopes to return to profitability by the fourth quarter, Wang reported. To boost sales, the company will increase its sales force by 400 people in the next six to nine months.

According to Marty Gruhn, vice-president of the Tempe, Ariz.-based Sierra Group, an industry research and consulting firm, "Wang is losing money because its products are not as competitive as those of other vendors in terms of price, performance and support."

Wang's No. 1 priority should be to improve customer service, Gruhn said.

Wang must also bring its prices and performance up to parity with

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▶ INTERNATIONAL ISSUES

ITT, CGE detail plans for joint telecom unit

BY PAM POWERS
Senior Editor

BRUSSELS, Belgium — ITT Corp. and Compagnie Generale d'Electricite (CGE) last week outlined the structure of the new telecommunications equipment company the two officially formed in the waning days of 1986.

The company, Alcatel N.V., formed by the merger of CGE's and ITT's telecommunications operations, is reportedly the world's second largest telecommunications firm, behind AT&T. The venture is 55% owned by CGE and 37% owned by ITT.

The new firm will maintain its head office in Amsterdam and have its operating headquarters here. It will maintain two holding companies in the U.S., Business Communications, which will market key systems, private branch exchanges and personal computers; and Cable Telecommunications Operations, which will market communications cable and fiber optics.

The current chairman and chief executive officer of CGE, Pierre Suard, will be CEO of the new company, and ITT's chairman and CEO, Rand Araskog, will chair Alcatel's supervisory board.

The company will be structured according to major business lines, with subsidiaries having sole responsibility for individual classes of products. Principal market areas to be addressed by Alcatel include fiber-optic transmission, radio communications, satellite earth stations, business communications, consumer products and software.

Under the agreement, ITT transferred all assets to the new company and will market its central office switches, PBXs, key systems and other equipment under the new name in the U.S. and Europe. CGE will also market a line of telephone switches through the joint concern.

The combined companies had worldwide 1986 revenues of $12 billion.

▶ SATELLITE SERVICES

IBM, Merrill Lynch can financial data venture

BY MICHAEL FAHEY
Staff Writer

NEW YORK — IBM and Merrill Lynch & Co., Inc. have scuttled International Market Net (Imnet), their 3-year-old joint venture to provide financial information to investors via satellite.

A statement issued recently by IBM and Merrill Lynch said Imnet was folded after "a reassessment of financial viability." A spokesman for Imnet explained that the partners in the venture determined "it would be a long, long time before the venture was profitable." The companies would not disclose how much Imnet subscribers were paying for the service. At the time of the announcement, Imnet had 50 users within Merrill Lynch and an equal number outside the brokerage house. Neither company would disclose the amount of its investment in Imnet.

The Imnet service used very small aperture terminal gear supplied by Equatorial Communications Co. in Mountain View, Calif. Financial information transmitted from Equatorial's Mountain View earth station was bounced off a satellite to subscribers' VSATs.

The joint venture, formed in 1984, was initially designed to serve Merrill Lynch's brokers, and later be expanded to serve other subscribers. Industry watchers, however, said Imnet encountered stiff competition from already established financial information providers and users who were reluctant to shift allegiance.

"The users of that kind of service don't like to make rapid changes," said Marc Rudov, president of Telematic Resource Group, a Wellesley, Mass.-based consulting company that tracks banking and investment technology. "There are several companies that have a firm hold on the investment information business." Rudov cited Quotron Systems, Inc. as the leading provider of information services and hardware for investors.

Jack Musgrove, associate director of Dataquest, Inc., a San Jose-based market research and consulting company, added that Imnet failed to differentiate itself from its competitors. Moreover, Musgrove said, IBM and Merrill Lynch may have underestimated the size of investment and length of time needed to make the joint venture successful.

"It is difficult enough to provide a nationwide transmission network," Musgrove said. "It becomes even more difficult when you are trying to add value to that network."

At the time the venture was formulated, IBM was expected to contribute its expertise in computers and Merrill Lynch was tagged to develop financial information software and market the service.

Telematic Resource Group's Rudov said Merrill Lynch's involvement in the venture may have made other brokerage houses leery of subscribing to the financial information service.

An Imnet spokesman claimed the company's service was more advanced than other available financial information systems. He said Imnet users could analyze and manipulate the information they received on their personal computer screens. Other on-line financial information systems simply provide raw data to users without allowing the user to manipulate the data.

According to the spokesman, Imnet was considering using Vertical Blanking Interval (VBI) transmission to send stocks and bonds prices and other financial information. VBI transmission uses the nonvisible portion of television signals to transmit data. In February 1986, Imnet terminated a contract with the Public Broadcasting Service for VBI capacity. Imnet was, however, considering other VBI vendors until the announcement of the company's closing, the spokesman said.

A Merrill Lynch spokesman said that among Imnet's 298 employees were 15 from his company and 16 from IBM. Those employees will return to Merrill Lynch and IBM. The Imnet employees will be laid off and receive four months' pay and benefits. An Imnet spokesman said the company will likely cease operations by Feb. 6. ◪

competitors, particularly Digital Equipment Corp. The troubled vendor must also attempt to change its image from that of simply a vendor of word processing equipment, she claimed.

Wang is expected to boost its product offerings with the introduction of two mid-range VS minicomputers this week. ◪

TELECOM TRENDS

CBX compatible with AT&T digital services

Rolm Corp.'s Computerized Branch Exchange (CBX) T-1/D3 interface for the switch maker's CBX II 9000 private branch exchange has been judged by AT&T to be compatible with three of the long-distance carrier's digital services. The Rolm switch complies with interface specifications set by AT&T technical publications for interconnection with AT&T's Accunet T-1.5, Megacom and Megacom 800 services.

Carrier snapshot
National Telecommunications Network

Network route miles: 11,951 (planned)
8,005 (operational*)

Transmission media: Fiber-optic cable, digital microwave
Services offered: point-to-point private lines
Service speeds: 64K bit/sec, 1.544M bit/sec and 45M bit/sec.

	Route miles		
	Planned	Operational	Cities served
Consolidated Network, Inc.	731	300	4
LDX Net, Inc.	2,161	2,076	19
Litel Communications Corp.	1,363	971	28
Microtel, Inc.	1,307	1,038	25
Southern Net, Inc.	1,616	1,460	35
Southland Fibernet	332	272	5
Williams Telecommunications Co.	4,431	2,535	12

* As of Nov. 30, 1986.
NTN is a consortium comprising the companies listed above.

SOURCE: NTN, ROCKVILLE, MD.

CROSS TALK
BOB WALLACE

Long-distance users to benefit from coast-to-coast fiber networks

The Great Fiber Race is well under way.

Although the participants have not yet completed construction of their nationwide communications networks, three carriers have already managed to stretch fiber-optic cable from the Atlantic to the Pacific.

US Sprint Communications Co., MCI Communications Corp. and the National Telecommunications Network (NTN) maintain they have a transcontinental fiber-optic cable system in place. AT&T and Cable & Wireless Communications, Inc. have also delineated plans to add fiber to their network diet.

Users will benefit from the efforts of these long-distance service providers as the fast-growing supply of capacity on lightwave systems outstrips demand. These fiber service providers have trained their marketing efforts on large users that need to interconnect many geographically dispersed locations. This latest flurry of fiber network construction will, however, immediately benefit medium and small users who will look to these long-haul carriers as bypass service providers.

For example, several users have acquired bulk bandwidth from NTN, a consortium of seven regional, and predominantly fiber-optic, carriers for medium distance, point-to-point communications applications. Users

picked specific fiber links between major cities without purchasing nationwide service on the yet to be completed nets.

Long-distance fiber network capacity provides communications managers with the opportunity to reconfigure their communications networks. The abundance of carriers offering long-haul lightwave facilities will intensify competition in this

> *Users will benefit from the efforts of these long-distance service providers.*

market, which in turn will drive the cost of this capacity down.

The steady growth of these fiber networks should serve to boost the availability and popularity of a variety of videoconferencing services. For the most part, users that want to broadcast a video message to multiple locations have three choices. The user can create a private,

dedicated video net comprising high-speed digital services such as AT&T's Accunet service offerings, add a video application to an existing net or use a private videoconferencing network service like US Sprint's Meeting Channel.

The steady rise in supply of long-distance, high-speed digital links, especially at T-1 speeds and above, will offer the communications manager a variety of vendors from which to choose to implement full-motion videoconferencing services. These services generally require more bandwidth than is used in diluted videoconferencing applications.

The availability of fiber-optic network capacity will also trigger a rekindling of interest in bypassing Bell operating companies. Users can add fiber-optic cable to their depleted arsenal of bypass weapons. Use of lightwave services from carriers other than BOCs should eventually position these services in direct competition with private, point-to-point microwave systems.

The ascendancy of fiber as a bypass service could sound the death knell for data transmission on cable television systems, which were once considered a potentially attractive local data transmission alternative, but are now used sparingly in just a few metropolitan areas.

► WATS ALTERNATIVES

Pro America earns new look

Rate cuts give service more appeal.

BY MICHAEL FAHEY
Staff Writer

Cost savings may be in store for users who opt for AT&T's Pro America services in light of recent pricing changes that, in some cases, make those services more attractive than WATS.

The Federal Communications Commission-mandated rate reductions, which took effect Jan. 1, reduced the cost of Pro America II and Pro America III by an average 13.3%. WATS rates, however, dropped only an average of 4.4% overall. That means that, depending on their calling patterns, some WATS users could save money by switching to Pro America.

"Many users will find Pro Ameri-

> *Any user thinking about WATS should be considering Pro America.*

ca II and III cheaper and certainly no more expensive than WATS," said long-distance service analyst Robert Self, president of Market Dynamics, a New York-based telecommunications consulting firm. "Any user thinking about WATS should be considering the Pro America services as well."

Unlike AT&T's Pro America services, WATS is a banded offering. Band 1, for example, allows users to take advantage of WATS rates in neighboring states. Each successive band the user subscribes to gives WATS a wider geographical reach.

Pro America I, II and III are call options for business customers that make more than 25 hours of direct distance dial calls per month. The services carry a one-time $10 service charge and a flat monthly fee per phone number.

Pro America II is designed for users who make roughly 25 hours to 200 hours of interstate calls per month. Pro America III is designed primarily for users with up to 1,000 interstate calling hours per month.

The previous monthly charge for Pro America II has been reduced from $115 to $85, and the usage

▶ NAVAL MANEUVERS

AT&T wins nod from Navy for major net

10-year contract calls for construction of fiber-based voice system.

SAN FRANCISCO — AT&T has snatched away a 10-year, $92 million telecommunications network contract from private branch exchange market competitors such as Northern Telecom, Inc. Under the agreement, AT&T will construct, manage and maintain a telecommunications network linking 14 U.S. Navy facilities here.

The pact calls for a voice communications system capable of handling some 40,000 telephone lines. The system can reportedly accommodate a maximum of 120,000 lines.

An AT&T spokesman explained the fiber-optic cable runs will be used to hook many of the naval bases, located in the San Francisco Bay area, to the PBXs. Several naval facilities located on islands will be hooked to the PBXs using point-to-point microwave links.

Once completed, the network will showcase AT&T 3B computers and multiple AT&T System 85 digital PBXs. An AT&T computer software system will manage administrative aspects of the network's operation. A 130-employee task force will handle the engineering, implementation and operation of the network. ◪

Pro America from **page 9**

charge will drop 13.2%. The monthly charge for Pro America III has dropped from $450 to $350. The usage charge for the service dropped 12.5%.

"With Pro America II and III, users receive call detail reports that list what areas were called, the length of the call and when the call was made," Self said. "WATS users don't get that call detail reporting."

Self explained that Pro America services also make use of standard telephone lines, which can also be used for other types of local and long-distance calling services. WATS users must have special lines installed for each band of service.
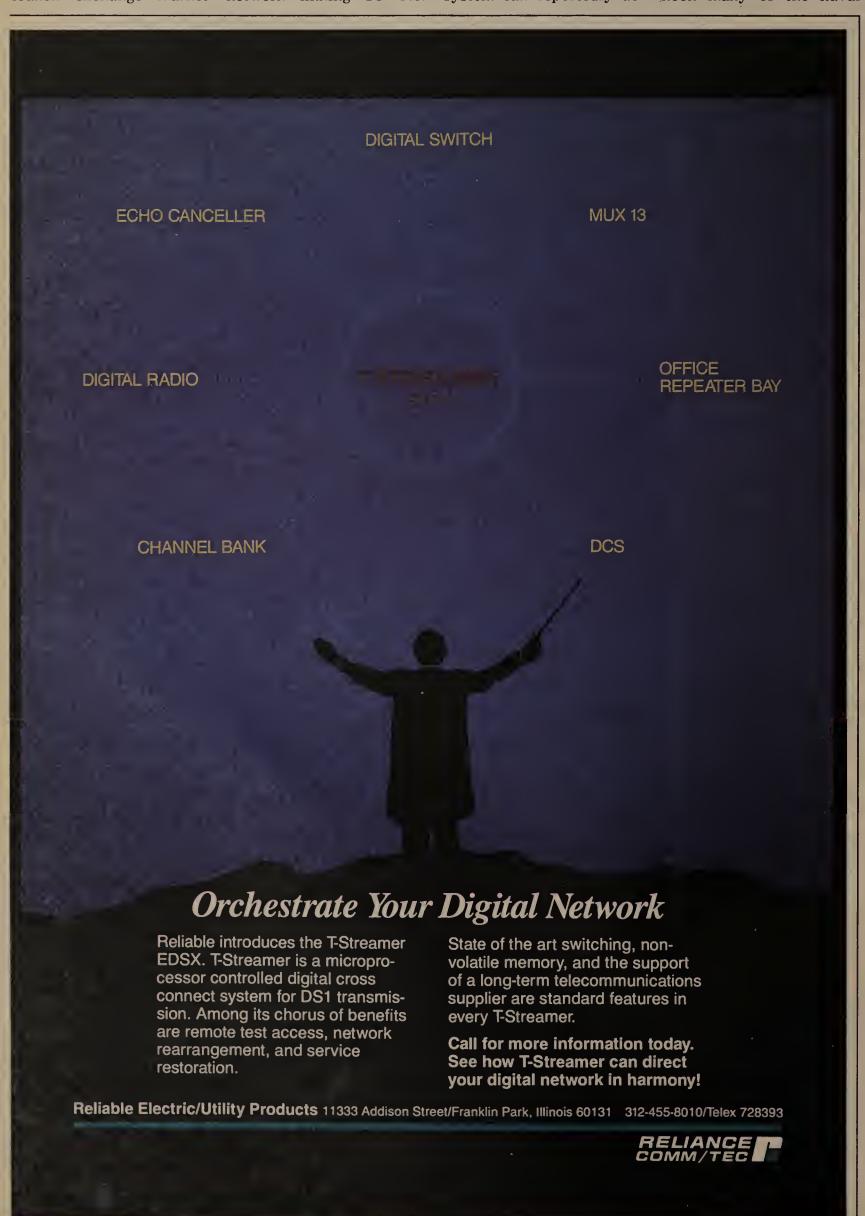
In addition to pricing changes, the WATS tapering, or discount, scheme has been altered. Prior to the latest rate changes, WATS users received an 11% discount after 15 hours of calling per line. After 40 hours, the discount rose to 22%. Now, WATS users receive a 5% discount, but only after they have racked up 25 hours of calls. Users receive a 10% discount after placing 100 hours of calls per line.

WATS access-line rates did, however, drop from $50.50 to $36.40 per month under the new price structure.

In addition, the new pricing scheme eliminates Group Average Billing for WATS customers. Under this pricing scheme, traffic for each band was divided by the number of trunks serving the band. Under the new pricing structure, discounts are taken from the total volume of calls for each band.

"This reduces the need to pack your WATS line with traffic," Self said.

"Because the discount is based on volume per band instead of average volume per line, you don't have to worry about reducing the average by using too many lines." ◪
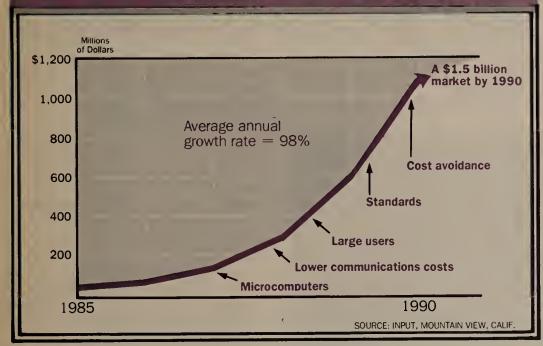
DATA DELIVERY

66 This year, the real winner in the T-1 battle will be the advertising agencies that vendors will rely on to position their products. A lot of money will be spent on desktop publishing systems to produce all of the advertisements and brochures vendors will use in the coming year.

Timothy Zerbiec
Vice-president
Vertical Systems, Inc.
Dedham, Mass.

Growth of electronic data interchange market

Millions of Dollars

$1,200
1,000
800
600
400
200

A $1.5 billion market by 1990

Average annual growth rate = 98%

Cost avoidance

Standards

Large users

Lower communications costs

Microcomputers

1985　　　　1990

SOURCE: INPUT, MOUNTAIN VIEW, CALIF.

▶ MARKET INSIGHTS

Competition heats up in front-end marketplace

BY PAUL KORZENIOWSKI
Senior Editor

FRAMINGHAM, Mass. — Growth in the front-end processor market may be slowing down but competition is accelerating, according to "Communications Processors," a report completed by International Data Corp. (IDC), a market research firm here.

IDC defined a communications processor as a device that formats, manages and monitors the flow of information between computers and peripherals. In addition to acting as a front end to a host, the devices can switch messages and remotely concentrate data.

In 1985, shipments of communications processors grew at a rate of 11%, which was 7% lower than 1984's rate. Revenue increased by 14%, compared with a healthy growth rate of 35% in 1984.

Prices are expected to decline by an average of 2% for the next five years as a result of slower growth rates, better manufacturing techniques and competition.

IDC divided the communications processor market into two categories: devices used with IBM hosts and those designed for non-IBM systems. Unit sales of front-end processors for IBM hosts grew 14% from 5,935 to 6,760. Revenue was up 14%, to $692 million from $608 million. IBM has an 82% share of this market. In 1990, revenue is expected to reach $1,104 million for that market.

Despite the market's declining

returns, competition is intense and a number of companies announced significant new products in 1986. IBM enhanced its 3725 to handle more internal memory, unveiled a remote front-end processor and enhanced its network management offerings so they can be controlled by one product, Netview. The new

▶ MULTIVENDOR NETWORKS

DISOSS link satisfies N.C.

BY PAUL KORZENIOWSKI
Senior Editor

CHARLOTTE, N.C. — The first user of Data General Corp.'s enhanced DISOSS link is happy with the product but would still like to see tighter integration of the IBM and DG worlds.

Two years ago, the state of North Carolina found itself supporting a hodgepodge of equipment, including IBM 3270 series terminals, System/36 minicomputers, personal computers and processors from DG, Wang Laboratories, Inc. and Digital Equipment Corp. Hardware incompatibility prevented workers in various departments from easily transferring documents. So the state chose DISOSS as its electronic mail standard in an effort to alleviate the problem, said Nanette Kean, system programmer for end-user computing.

DISOSS, which runs under CICS on an IBM mainframe, handles E-mail and library functions. The product's E-mail capability enables users to exchange messages, and its library services allow them to archive documents, search for a docu-

ment by author's name or title and retrieve needed documents. DISOSS documents conform to IBM's Document Interchange Architecture (DIA), which acts like a mailing address on an envelope and Document Content Architecture (DCA), a uniform manner for formatting data inside an envelope.

Last June, DG announced the second version of its DISOSS link, Comprehensive Electronic Office (CEO)/Document Exchange Architecture (DEA). The product garnered a lot of publicity because it enabled a DG superminicomputer to act as an IBM Physical Unit 2.1 device and establish peer-to-peer communications with a host. Most vendors' DISOSS connections only allow a processor to act as a dumb device, such as an IBM controller. The enhanced version also enables a DG processor to act as an IBM Systems Network Architecture Distribution Systems node, capable of storing and later forwarding messages to DISOSS users.

The state was interested in the product because its IBM 3090 mainframe was overloaded. CEO/DEA

DATA DIALOGUE
DONALD H. CZUBEK

Peaceful coexistence is possible

Recently, IBM has tried to convince the world that it is serious about supporting the International Standards Organization's (ISO) Open System Interconnect (OSI) model. The clamor has been so loud that some analysts are speculating IBM will eventually abandon Systems Network Architecture in favor of international standards.

It's a mistake to confuse IBM's support for standards with a move away from SNA and related technologies. IBM will not abandon SNA in favor of standards. Rather, the two will coexist in both IBM and non-IBM products.

Czubek is president of Gen2 Ventures, a Saratoga, Calif., company that specializes in multivendor networking.

Within the next few years, most large organizations will want to purchase products that support international communications standards as well as, not instead of, SNA networks. Such coexistence protects investments in current and future IBM products and allows OSI-compatible products to share network resources.

An example of such a product is IBM's X.25 Interconnection (XI), which was announced earlier this year. XI allows X.25-compatible products to communicate with each other through an SNA network.

XI is a software package that runs on an IBM 3725 communications controller along with Network Control Program and turns an existing SNA network into an X.25 network. This re-

quires a little explanation, because there's a lot of misinformation concerning what we mean by an X.25 network.

The confusion stems from the fact that there's really no such thing as an X.25 network. People talk about X.25 networks, but what they really mean is a network with an X.25-compatible interface, not a network that uses X.25 internal protocols. X.25 is a definition for the interface between computers and workstations, known as data terminal equipment (DTE), and packet-switching network controllers, which are called data communications equipment (DCE). Protocols used within the network are not defined by X.25 at all. Therefore, any type of protocol could be used, including

DISOSS from **page 11**

would enable a DG superminicomputer to format, store and process DISOSS documents, work typically done by an IBM host. Also, conformance to DIA and DCA would establish a needed file transfer standard.

The state, which had not worked with the first version of the link, began testing the new product in October. Kean reported that only a few weeks were needed to get the software up and running. Minor quirks did emerge when the state linked the two vendors' DISOSS implementations.

Generally, the state is pleased with the product and plans to purchase it. However, Kean would like to see a number of enhancements

both to DISOSS and the DG offering. A major problem is that users currently have to know where a document resides. "We would like to see a universal addressing scheme so users can find any document they need," Kean said.

Another item is elimination of a Long-Short message. CEO/DEA has a special feature that transforms a note into a document, if the note becomes too long. But that feature, Kean said, has confused some users who are often unaware they are working with a document that has been expanded from a note.

Kean said that DG's product was much easier to use than IBM's DISOSS products such as Personal Services and Displaywriter. Despite DG's ease-of-use benefits, Kean is

not satisfied with the user interface. She would like to see the product more tightly integrated into both DG's CEO, the company's office software and DISOSS.

Before DISOSS can be implemented on a wider scale, training problems and support questions have to be resolved. Kean is one of two people charged with training and support tasks and admits that the group is unable to meet demand for DISOSS. **Z**

Processor from **page 11**

NCR Comten, Inc. 5660 dwarfs IBM's offering in internal memory and in the number of lines it can support.

For the non-IBM market, reve-

nue grew by only 6%, from $194 million to $206 million and will reach $260 million by the end of the decade. Unit shipments in 1985 increased by only 3%.

Burroughs Corp. leads this market segment with a 22% share. The company plans to enhance its offerings so they can work with both IBM and the company's proprietary networking scheme. During the next few years, integrating its communications processor with those from recently acquired Sperry Corp. will present Burroughs with its biggest challenge.

The result of the new product announcements is that front-end processors have become more modular, which enables users to migrate to more powerful models more easily.

The report, which costs $1,500, is available from Dorothy Ferriter at IDC. The phone number is (617) 872-8200. **Z**

XI from **page 11**

SNA. IBM has been providing products with DTE interfaces for several years. The DTE interface allows IBM products to connect to packet networks that support the X.25 interface.

The missing link was support for an X.25 DCE interface, and that's where XI comes into play. It provides an X.25-compatible interface to SNA networks. The XI software runs in the 3725 communications controller and provides an X.25 DCE interface. This interface allows X.25-compatible computers and workstations, or DTE, to connect with each other through an intermediate SNA network.

With XI, the SNA network becomes the backbone packet network — SNA works with a packet-switched technology — through which X.25 DTEs communicate with each other.

Through the use of XI, any X.25-compatible products, including non-IBM products, can communicate with one another. It's important to remember, however, that since X.25 only addresses the lower level connectivity issues, the two communicating devices must also use compatible higher level protocols and data streams in order to carry on a meaningful conversation.

The XI is important because it foreshadows IBM's support for standards. IBM won't abandon SNA and its other architectures because IBM must base its product plans on technologies that it controls. On the other hand, IBM technologies will coexist with international standards and allow the connection of non-IBM products to SNA networks.

XI is just one of the products that follows this trend. IBM has also announced products that will transport 3270 data streams through networks using Manufacturing Automation Protocols. IBM is expected to add similar products in the future, such as gateways between DISOSS and X.400 electronic mail systems.
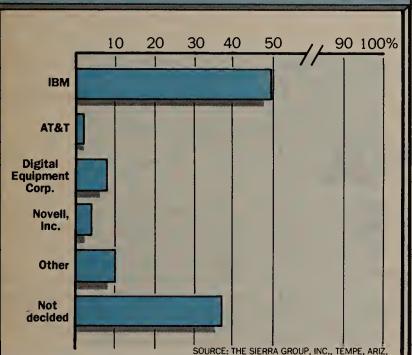
IBM communications doesn't just mean SNA anymore. **Z**

LOCAL NETWORKING

Making the right connections

Bridge Communications, Inc. will take its one-day seminar, "Making the Right Connections," on the road, beginning March 3. The seminar, which will address networking applications, technologies and benefits, is aimed at network planners. It will cover 16 cities and run through June 18. Registration is $45. For more information, contact Shelley Hurst at (415) 969-4400.

MIS executives reveal network vendor preferences and indecision

SOURCE: THE SIERRA GROUP, INC., TEMPE, ARIZ.

▶ INTERCONNECTIVITY

Mini vendors aim at PC connections

Customers keep pushing for better links.

BY PAULA MUSICH
Senior Editor

Minicomputer vendors are improving connectivity options between their departmental systems and personal computers by using local-area networks as a foundation, but progress has been slow.

Pushing product development are customers who are demanding greater integration of personal computers with departmental systems. Plain vanilla terminal emulation, the first strategy to be imple-

mented, is not enough, according to industry consultant, Andria Rossi, president of Rossi Consultants, a firm in Marblehead, Mass.

Vendors such as Hewlett-Packard Co. and Digital Equipment Corp. pioneered the push for personal computer integration. Both companies have ported selected minicomputer applications down to personal computers as the next step in the evolution of integration.

"HP was the first to embrace the person-

NETWORK NOTES

Excelan Corp. of San Jose, Calif., and The Santa Cruz Operation, Inc. (SCO) have announced they will jointly develop and market products designed to integrate Excelan's Transmission Control Protocol/Internet Protocol (TCP/IP) products and SCO's Xenix-Net. SCO's Xenix-Net is a distributed file system for Xenix- and MS-DOS-based processors.

It is based on Microsoft Corp.'s MS-Net networking protocols. Under the terms of the agreement, Excelan will add a protected-mode Network Basic I/O System (NETBIOS) driver to its Ethernet TCP/IP networking software, and SCO will add support for the networking package in its Xenix-Net program.

The joint development effort will allow network users to share a distributed file system and simultaneously run terminal emulation or high-speed file transfer programs. The products, which will be available in the first quarter of 1987, will be demonstrated at the Uniforum trade show Jan. 20 to 23 in Washington, D.C.

The first third-party diskless personal computer to be certified on **3Com Corp.'s** Etherlink personal computer network belongs to San Jose, Calif.-based Kimtron Corp.

Kimtron's Satellite diskless personal computer, which retails for $995, is certified to operate on the Mountain View, Calif.-based 3Com network using an EtherLink board with the 3+Start PROM, 3Server3 network server in addition to 3+Share network operating software.

Network General Corp. has added an option for The Sniffer, a portable IBM Token-Ring protocol analyzer that operates with Novell, Inc.'s NetWare and Xerox Network System protocols.

The Novell NetWare Core Protocol Suite can be a replacement for or extension of The Sniffer's standard protocol suite. This suite, priced at $995, includes NETBIOS, LU 6.2 and Server Message Block protocols.

The protocol analyzer performs data collection, recording and analysis and real-time monitoring of token-ring networks.

Network Research Corp. of Oxnard, Calif., said recently that it will provide fault-tolerant computer maker Stratus Computer, Inc. of Marlboro, Mass., with the source code for its Fusion Network Software supporting TCP/IP networking protocols.

Using the Fusion software, Stratus will explore networking opportunities in on-line transaction processing.

Proteon, Inc. of Westborough, Mass., has developed an 80M bit/sec token-ring network interface for Gould, Inc.'s PowerNode and Concept/32 high-speed computers. The new interface board, the p1680, links to the SelBUS-based computers via Gould's High-Speed Data Interface II.

Intended for real-time applications that require fast processing times and multivendor connectivity, the p1680 is priced at $2,900. It

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LANMARKS
PAULA MUSICH

Pricing, service and support to highlight '87

Every year around this time industry watchers polish their crystal balls to sneak a view into the future. Among the images becoming clearer in the orb are wiring wars, pricing trends, service and support issues and a token-ring to rule them all.

This year AT&T Starlan and Starlan-compatibles will fan the flames around the burning issue of wiring. Unshielded twisted-pair wire — telephone wire — is the foundation for Starlan and AT&T's strategy to sell into a market it is late in entering. Championed by AT&T, conceded to by IBM and still shunned by Digital Equipment Corp., telephone wire is cheap, abundant and available in most of our walls and ceilings.

Despite these advantages, phone wire may still not be appropriate for some users' networking

needs. Because of the bandwidth and distance limitations, unshielded twisted-pair wire is not adequate for large-scale networks or networks that are intended to support heavy traffic. But for networks supporting casual users and connecting primarily personal computers, it can fit the bill.

Starlan and company will also fuel increased price competition among personal computer networking vendors, although this is "a common business cycle in the maturing local network market," said Eric Killorin, publisher of the Andover, Mass.-based newsletter, *PC Netline.* "We may start seeing price comparisons on the low end in 1987 buying habits."

The increased competition in pricing may cause a shakeout of sorts as prices for personal computer net-

> **❝Starlan will also fuel price competition among personal computer net vendors. ❞**

▶ PRODUCT DEVELOPMENT

Convergent, Locus to launch 80386 software

BY PAULA MUSICH
Senior Editor

SANTA MONICA, Calif. — Convergent Technologies, Inc. and Locus Computing Corp. recently agreed to codevelop integrated MS-DOS and UNIX software for Convergent's 80386-based products. The products under development, which are expected to be available in three to four months, will allow several DOS and UNIX programs to run simultaneously on workstations or be accessed by terminals. Locus marketing manager, Michael Lewis, anticipates the first products to become available will be priced below $500. No value was placed on the agreement.

The applications will be based on Locus' Merge386 system software, which combines DOS and UNIX in a unified environment. "Merge386 takes advantage of the virtual machine capabilities of the Intel Corp. chip," Lewis said. When combined with the multitasking capabilities of UNIX, the Locus product can support multiple DOS environments at a console or remote terminal.

The Merge family of products includes password security and file protection for DOS users, record-level access to the same files for DOS and UNIX and the ability to invoke programs from applications based on either operating system. *Network World* has also learned that Locus is readying an upgrade to its PC Interface software, a UNIX-based file server that enables DOS tasks to run as subsets under UNIX.

PC Interface Release 3.0 will incorporate a subset of Microsoft Corp.'s MS-Net core protocols and support IBM's NETBIOS networking protocols.

Locus is also rewriting its proprietary Ethernet driver to allow the software to be used over a wider range of network types, including token-ring networks, X.25 networks and networks supporting Transmission Control Protocol/Internet Protocol and Xerox Corp.'s Xerox Network Systems net protocols, Lewis said.

OEMs using the current version of PC Interface Release include AT&T on its Starlan network, Sun Microsystems, Inc., Texas Instruments, Inc. and Motorola, Inc. The new release is expected to be available by the end of the first quarter of 1987.∎

Notes from **page 13**

is available now. A separate diagnostics program is available for $250.

Proteon's ProNET-10 Token Ring Network was also added to the list of personal computer networks certified for use with Kimtron Corp.'s diskless personal computers.

The KW Series of diskless micros were tested with Proteon p1300 interface cards, remote boot ROM and Novell's Advanced NetWare/P networking software.

Westcon Associates, Inc. enhanced its Arcmonitor diagnostics software to support larger Arcnet networks and provide additional monitoring features. The menu-driven Arcmonitor-Plus program displays node addresses and packet counts, data transmission rates and percent of bandwidth used data.

It also tests individual personal computer interface boards and includes a reconfiguration alarm that alerts a network administrator when unusual reconfiguration activities occur.

Upgrades are priced at $25, and the program is sold separately for $45.∎

1987 from **page 13**

work adapter cards decline, according to Mark D. Stahlman, a securities analyst with Sanford C. Bernstein & Co., Inc., of New York.

Technical and performance issues on personal computer networks are giving way to the more "uninteresting, business-oriented issues, such as service and support, in addition to lower prices," Killorin maintained.

"We'll see service firms configuring networks for customers in the same way that consultants have been doing."

Despite this move away from technical issues, the token passing vs. carrier sense multiple access with collision detection issue (or IBM Token-Ring Network vs. Ethernet) will rage on.

In this battle, the Token-Ring will gain ground as IBM ships its network links for larger processors.

Stahlman says he expects token-ring networks to become more popular during the second half of this year.∎

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Connectivity from **page 13**

al computer into their architecture, and many vendors have copied their methods,'' Rossi said. "Although HP was the first to port [office automation] applications, it has provided a confusing array of options that are too difficult for users to sort through," Rossi said. "They also don't have an office automation image."

HP DeskManager is an example of a minicomputer application ported down to HP and IBM personal computers. This program operates on minicomputer systems in conjunction with a component running in the personal computer called AdvanceMail.

It is integrated into HP's AdvancedNet OfficeShare networking family, which includes the HP Thinlan coaxial-based network, the HP Starlan twisted-pair-based network and a remote asynchronous option, according to Gerry Lameiro, product manager for the Colorado Networks Division of HP.

DEC followed suit with a personal computer version of its WPS+ word processing program, and Data General Corp. ported its CEO Write word processing software down to the personal computer.

The next step in the integration evolution came with the incorporation of personal computers in distributed applications. These applications include electronic mail and file distribution. HP allows a personal computer file to be mailed to "anyone on the whole network,"

according to Royce Murphy, a product manager in HP's office systems division.

"We've tried to tie [personal computers] in as transparently as possible," Murphy said. "The user doesn't have to be involved in the conversion of word processing files. The electronic mail program recognizes the different players and does the conversion."

With spreadsheets, which can be sent to different personal computer applications or incorporated into HP 3000 applications, the user must perform the conversion. For example, a Lotus Development Corp. 1-2-3 file would have to be converted to another file to be mailed to a Visicalc program or HP 3000 application.

Beginning this year, DEC will allow personal computers to use electronic mail facilities and participate in the firm's All-In-1 office system through PC All-In-1. This requires personal computers to be linked to a dedicated MicroVAX via an Ethernet connection or asynchronous link.

DEC's VAX/VMS Services for MS-DOS programs will provide personal computers with file transfer capabilities and allow applications to be shared with VAX minicomputers, according to Joanne Correia, DEC's personal computer interconnect marketing manager.

DG has not yet followed suit. "Ultimately, we would like to distribute more functions down to the personal computer to get the benefits of a departmental minicomputer and the power of the personal computer," said Joe Forgione, group manager for communications product marketing at DG.

The next step in the personal-to-minicomputer integration evolution will be the "ability to access a program through another program and transfer files between those programs," Rossi said.

HP provides this type of task-to-task communication over a Starlan network using HP's Information Access program. The program allows personal computer users to access the HP Image data base on an HP 3000 and also to retrieve, organize, format and download the data into applications such as the Lotus 1-2-3 spreadsheet program, and Ashton Tate's dBASE II and Microrim, Inc.'s R:Base Series 5000 data base management programs. The menu-driven Information Access program "tells the user the estimated time to complete a job and includes a built-in report generator to off-load MIS report requirements," Lameiro said.

DEC has also begun to implement this type of task-to-task communication. It's first attempt to provide this level of integration is its VAX Xway program. Xway allows personal computer users to exchange spreadsheet models and data between spreadsheet programs such as the Lotus 1-2-3 as well as Visicalc, Microsoft's Multiplan and DEC's DECcalc applications.

For example, while using a Lotus 1-2-3 spreadsheet, a customer can pull information down from a VAX data base. This application is the first of several that will be layered on top of DEC's local network, DECnet, according to Correia. Different divisions at DEC are developing these applications, she said.

This task-to-task communication allows users to build compound documents, which is the next era Rossi sees coming for personal computer integration. HP claims to already support compound documents that combine text, data and graphics. For the future, they plan to integrate voice and images into a compound document, Murphy said.

The ultimate level of integration for users, which is still just a goal, is the ability to distribute data bases. "Next to OA applications, people are asking for distributed data bases. It's a widespread demand," DG's Forgione said.▣

COMMUNICATIONS MANAGER

66 The United Mine Workers of America had plenty of work last month: more than 40,000 people in the information industry got lumps of coal in their Christmas stockings. AT&T's layoff of 27,400 was a surprise only in its size. IBM weighed in by firing a mere 10,000. MCI, the renegade of the long-distance business, announced that it was laying off 2,400. Lastly, PBX manufacturer Intecom fired 180 people.

From "Wiretap"
Published by Winston/Smith Associates
Bound Brook, N.J.

▶ RATE SHOPPING

Keeping track of tariffs

BY NADINE WANDZILAK
Staff Writer

Jim Keough, manager of telecommunications quality assurance for General Electric Information Services Co. (GEISCO), believes corporate parent General Electric Co. saves millions of dollars each year by carefully monitoring tariff changes and other regulatory actions.

GE is one of a growing number of companies devoting in-house time and talent to the task of keeping current with tariff and regulatory happenings. GEISCO, GE's Rockville, Md.-based information services arm, currently employs two full-time staffers — a manager of telecommunications affairs and a telecommunications affairs specialist — who monitor pricing changes and the actions of state and federal regulators.

Monitoring tariffs is nothing new to GE; GEISCO staffers have tracked tariffs and regulatory matters for roughly a decade, Keough said. GEISCO's tariff experts track tariff changes in both the U.S. and other nations. They are also called upon to testify before the Federal Communications Commission on proposed tariff modifications and regulatory matters. Keough declined to elaborate on that aspect of their job.

Whether a company assigns staffers to track change on a full- or part-time basis depends largely on the size of the company and its telecommunications bill. GE's telephone costs, Keough said, run into the hundreds of millions of dollars each year. But many smaller companies also take pains to keep up with tariff and regulatory issues.

At the Hartford Insurance Group in Hartford, Conn., a financial analyst in the communications support area spends about a third of her workweek keeping current with tariff and regulatory changes and analyzing their potential impact on the company, according to Sherman Murphy, director of communications. The Hartford has been monitoring tariffs and regulatory changes since divestiture.

The company has seen a savings in its communications costs. "The timing was right with things we were doing," Murphy said.

"For example, we were considering upgrading from some 56K facilities to T-1 at about the time AT&T filed for an attractive rate decrease."

Murphy anticipates that postdi-vestiture rate competition will continue for about two more years. When things settle down, he said, the need to stay on top of tariff changes will be lessened.

At a small company such as GMF Robotics Corp. in Troy, Mich., telecommunications manager John Reinicke said monitoring tariffs and regulatory issues is just part of the job.

"It's one of those things you have to watch," he said. He spends about eight hours a month monitoring tariffs. The company has about 500 employees and a relatively low amount of telephone traffic, Reinicke said.

Reinicke expects tariff-watching to take more of his time in the next month or two when the company starts to compare what its vendors are charging against what a tariff says they should charge.

"If we were a large corporation with an enormous amount of traffic, catching half a cent a minute on a particular tariff could make an enormous sum of money," he said. "In our case, it doesn't make an enormous difference. That's why I don't spend more time on tariff monitoring." He tracks tariff changes by being aware of potential changes and then asking vendors for current rate tables.

At Modesto, Calif.-based Memorial Hospital Association, the communications staffer responsible for overseeing operations also monitors pertinent tariffs, according to Kamruddin Shams, vice-president of information systems. The association operates a multisite network, and all the sites are within a radius of about 10 miles.

Every quarter, the association receives updated tariff information from carriers. "We constantly run random check comparisons between different vendors' prices," Shams said.

"But we won't change vendors based just on price," he added. "Our No. 1 criteria is service." ∎

GUIDELINES
ERIC SCHMALL

Ideal communications organizations

How a group decides to accomplish its goals determines the group's structure and ultimately its survival. If resources are not organized effectively, things fail, fall apart, disappear. As a result, the question of how to organize endures as a major concern to any manager.

This is especially true for the communications manager whose experience with this organizational conundrum has only just begun. As the communications function struggles to emerge and unify itself as a distinct corporate entity, the manager needs to establish a paradigm of the best possible organization and strive toward that ideal.

This ideal can best be realized by erasing the old demarcation lines between voice, data, text, video and so forth and arranging these functions so that they all conform to a triumvirate of needs: operations, research and administration. All three of these functions would report directly to the manager responsible for all information transfer.

Operations keeps the machines running and the lights on. People in this section work the private branch exchange switchboard, monitor data lines, install terminals and telephones and program communications systems changes. These people are the first line of defense against failures, outages or degradations

Schmall is network systems manager for an insurance holding company.

of service.

Operations is the outer layer of the communications organization with which users have the most frequent contact. As a result, the operations staff has to be not only mechanically competent but also well-versed in public relations. Operations is the oldest and most recognizable component of communications.

In contrast, the newest component of communications is the research department. Communications in today's environment can be hobbled by a lack of adequate planning and research. In less mature organizations, planning is simply an adjunct of the operations function. Efficient as this may appear, it is dangerous. Planning and research are often jettisoned by an overworked operations staff in order to cope with growth and emergencies.

Recognizing that a group relieved of day-to-day anxiety about network availability and troubleshooting can effectively deal with strategic issues, a manager will strive to create a research section. This group will keep current with evolving technology, regulatory changes and new communications opportunities. Equally important will be the integration of communications planning with corporate planning.

The entire structure, no matter how well balanced in terms of operational efficacy and planning prescience, will not be stable without an organized administrative component. Its primary function — to move bills, orders and change requests — provides the necessary lubricant to keep the communications machine from locking up.

This section develops and maintains procedures that allow for orderly change. It catalogs inventories, records growth, projects budgets, accounts for expenditures and reconciles accounts. It maintains contracts with vendors, lists product changes and oversees the technical library. Much like operations, it has a variety of user contacts so its public relations skills are as important as its strict attention to the minutiae of invoices and purchase orders.

Standing astride this triad, the communications manager directs the overall function of information transfer. He ensures that a proper balance of people and skills are aligned in each segment and that all three work in Swiss-watch synchronization.

This scenario represents an ideal. Depending on the evolution of the function in any one particular organization, there may be many obstacles to overcome: how (and where) to unify the voice and data staffs, convincing senior management of the need for a separate research staff, the overriding need for complete unity of command under one departmental manager. None of these obstacles can be recognized, or even approached, without the careful formulation of the ultimate model toward which the manager can strive.

In the new world of the IBM Token-Ring network it's nice to see an old familiar face.

The Token-Ring LAN is a reality. It shouldn't surprise you that IBM* was the first company to develop it.

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▶ Modem supporting autodial, error-correction
▶ Office channel unit

▶ COMMUNICATIONS RESEARCH GROUP

Bulk file link bows

Software ties PCs, minis to IBM mainframes.

BY JIM BROWN
New Products Editor

BATON ROUGE, La.— Communications Research Group released software that ties remote minicomputers and personal computers to IBM mainframes over asynchronous dial-up links.

The IBM mainframe-resident Blast Host package supports bulk file transfers between minicomputers and personal computers equipped with other Blast packages. A company spokesman said the firm has Blast versions available for 31 different operating systems.

The remote minicomputers and personal computers connect to a host mainframe through protocol converters, IBM 3725 and 3705 front-end processors outfitted with IBM's Network Terminal Option software, or X.25 packet-switching networks at speeds of up to 9.6K bit/sec.

Running as an application under IBM's VM/CMS and MVS/TSO operating systems, Blast Host converts ASCII data formats to EBCDIC data formats. Minicomputers and personal computers use local Blast packages to log on to the mainframe and control a Blast Host session. The host-resident package will support error checking of files transferred over X.25 packet-switched networks as well as provide an automatic connection to the mainframe over dial-up packet-switched networks.

The Blast package itself provides a VT-100 terminal emulation function that, when passed through a protocol converter, will make a personal computer appear to the host as an IBM 3270 terminal.

Also included with the Blast Host package is a dial-up management system that watches and logs transactions. It also provides the same password and security functions to the remote processors as are distributed to directly attached terminal users.

The Blast Host package for an IBM mainframe is priced at $5,500. A minicomputer-resident Blast package ranges in price between $495 and $1,295. Blast packages for IBM Personal Computers and Apple Computer's Macintosh cost $250 each. �Z

Review of the data PBX market in 1985

Gandalf Data, Inc. 16.0%
Infotron Systems Corp. 13.0%
Equinox Systems, Inc. 10.0%
Develcon Electronics, Inc. 9.0%
M/A-Com, Inc. 7.0%
Codex Corp. 3.0%
Other 5.0%
Micom Systems, Inc. 37.0%

Total data PBX market revenue = $73,395,000

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

▶ EQUINOX SYSTEMS, INC.

Data switch debuts

Entry-level networking tool links up to 16 ports at 19.2K bit/sec.

BY JIM BROWN
New Products Editor

MIAMI — Equinox Systems, Inc. introduced a data switch designed to connect 16 asynchronous devices over distances of up to 10,000 feet at speeds up to 19.2K bit/sec.

Targeted as an entry-level data switch, the Micro Data PBX (MDX) is compatible with the firm's other data switch models, which can all be tied into a network of switches. The device allows each terminal user attached to it to access its internal menu-driven software and select the device to which they wish to connect. Connections to other devices are made on a contention basis, and the unit features password protection.

According to the firm, the MDX allows terminals to share host system ports and switch connections between those ports. It also allows personal computers to share a modem and a serial printer. As part of the printer-sharing function, the MDX polls personal computers attached to it for print commands.

The firm said an MDX is capable of becoming a terminal server for the larger Equinox DS-5 or DS-15 Data PBX data switches.

Each device can be located up to 5,000 feet from the MDX switch, making the total distance between devices 10,000 feet. The basic unit supports eight lines. It can be expanded to support 16 lines with the addition of an Equinox LM-8 local multiplexer, an 8-port device that connects to the MDX over a composite link.

Devices connect to the MDX unit over telephone-type modular jacks and cabling. A company spokeswoman said the typical connection includes a modular adapter that connects to the coaxial cable coming from the rear of a terminal. Twisted-pair telephone wire is then used to connect to a punch down block, which in turn is connected to the data switch. Other connection options are available, the spokeswoman said, including an RS-232 distribution panel.

The 8-line MDX is priced at $800. The LM-8 local multiplexers are priced at $700. �

Products & Services

■ Call accounting software released

Xiox Corp. released an enhanced version of its Large Business Series call accounting system software package.

Version 3.0 of the 10-module **Xiox Large Business Series** package runs on IBM Personal Computers and prices, processes, and stores call records. It supports up to 5,000 telephone extensions and stores up to 500,000 call records.

The system has a library of 90 standard reports and includes a custom reporting capability.

The package's Quick Reports Scheduler supports user-defined report formats and lets users schedule the unattended generation and printing of reports.

The Organization Sort module supports call summary and detailed reporting by company division, group, department and extension.

The Repricer feature allows a user to reprice calls made over WATS, Tie and foreign exchange lines while the Re-Organization feature allows administrators to change extension and department numbers during reporting cycles.

The newly released version is priced from $3,900 to $14,000.

Xiox Corp., 577 Airport Blvd., Suite 700, Burlingame, Calif. 94010 (415) 375-8188.

■ Graphic display added to package

California Software, Inc. released an enhanced version of its Netman network management package.

Netman Release 4.0 includes a graphic reporting capability that displays the number of problems each data center or network group is handling. A spokesman for the company claimed the graphic display allows central site operation managers to more quickly determine the volume, age and priority of problems.

Other enhancements include improved user friendliness and increased reporting functionality.

Netman allows users to integrate problem tracking, network management and change controls on a single data base.

It is supported under MVS operating systems employing TSO or CICS, as well as VM operating systems using CMS, and DOS-VSE operating systems using CICS.

Pricing
Netman Release 4.0 will cost between $24,500 and $45,500.

California Software, Inc., 1950 Sawtelle Blvd., Los Angeles, Calif. 90025 (213) 479-5353.

■ Call accounting system

Management Access Control Systems, Inc. released a call accounting system reportedly able to work with most private branch exchanges and key systems.

The **Micro-Max** system consists of a Z-MDR microprocessor-based board that

Products & Services

Micro-Max from **page 23** attaches to PBXs or key systems over an RS-232 interface and IBM Personal Computer-resident software.

The Z-MDR plugs into a host IBM Personal Computer. Call information is transmitted from the PBX or key system to the Personal Computer at up to 1,200 bit/sec. Z-MDR boards attached to remote PBXs or key systems interface to a modem, which will transmit information to the host at speeds up to 19.2K bit/sec.

The Z-MDR board features a data collection buffer of 128K bytes capable of holding up to 9,700 call records.

The software stores collected information in files of up to 65,000 call records each.

The package supports from six to 300 telephone sets and user-defined call pricing rate tables. A cyclic redundancy error-checking scheme is employed when remote Z-MDR boards transmit to the host.

The software will also generate station detail reports, department summary, corporate summary, account code summary, daily call summary, calling-privilege abuse and number dialed reports.

The system costs $2,600 for a single site. Remote sites can be added for $1,500 each.

Management Access Control Systems, Inc., Suite 103, 2517 Highway 35, Building E, Manasquan, N.J. 08736 (201) 223-8500.

■ Modem supports error correction

Gandalf Data, Inc. added an error-correcting modem to its Access Series of dial-up modems.

The **Access Series 24V** modem supports such auto-dialing features as automatic redial, last number redial, a 400-character multiple-number dial recall list as well as alternate-number redial if the first number called does not answer.

The Access Series 24V is compatible with CCITT V.22bis and V.22 as well as Bell 212 and 103 modem standards.

Using either Gandalf's command set or a Hayes Microcomputer Products, Inc.-compatible command set, the unit provides full-duplex, 2-wire transmissions at speeds up to 2,400 bit/

sec.

Pricing

A stand-alone model is priced at $695, while a rack-mounted version is priced at $650.

Gandalf Data, Inc., 1020 South Noel Ave., Wheeling, Ill. 60090 (312) 541-6060.

■ Office channel unit

Teleprocessing Products, Inc. introduced an office channel unit designed to interface customer site digital data transmissions with hubbed or non-hubbed central office digital data

transmission equipment compatible with AT&T's Dataphone Digital Service (DDS).

For use in large private networks or telephone company central offices, the **TP-900** converts baseband bipolar line signals received from a customer site over a

4-wire local loop for transmission over digital data service equipment. The unit also converts signals received from central office subrate digital multiplexers or a multipoint junction unit to signals for transmission over the local loop.

The TP-900 supports a

Products & Services

mix of up to 20 subrate office channel units and 56K bit/sec office channel units. The subrate office channel units support switch-selectable speeds of 2,400 bit/sec, 4.8K bit/sec and 9.6K bit/sec. The unit also includes an alarm card capable of connecting to central office audio/visual alarm systems.

Pricing for TP-900 office channel units starts at $595 per channel, depending on configuration.

Teleprocessing Products, Inc., 4565 E. Industrial St., Building 7K, Simi Valley, Calif. 93063 (805) 522-8147.

Local network for IBM 3270-PCs

ACS Telecom announced a local-area network designed to link IBM 3270-Personal Computers and 3270-AT Personal Computers.

The **10-3270** local-area network connects 3270-Personal Computers, which include built-in IBM Systems Network Architecture gateways, without a dedicated server and supports network functions while the 3270-Personal Computer is connected to a mainframe. The network supports electronic mail,. printer spooling, data sharing and program sharing functions. The package uses 65K bytes of the 3270-Personal Computer's random-access memory.

The 10-3270 package costs $995 per node.

ACS Telecom, 25825 Eshelman Ave., Lomita, Calif. 90717 (213) 325-3055.

Fiber device links IBM 5251s to host

Honeywell, Inc. introduced a fiber-optic multiplexer that links IBM 5251 cluster controllers to host systems.

The **HFN9318** operates with Honeywell's HFN9308 multiplexers and HFM5300 and HFM5305 modems. The HFN9318 receives signals from HFN9308s connected to IBM 5251 cluster controllers. The HFN9318 supports eight twinaxial ports and multiplexes all signals it receives onto a single full-duplex fiber-optic link, which transmits over distances of 15,200 feet.

A rack-mounted version of the HFN9318 costs $8,270. A cabinet-mounted model lists for $9,183.

Honeywell, Inc., 2701 4th Ave., S. Honeywell Plaza, Minneapolis, Minn. 55408 (612) 870-5200.

Modem supports four autodial protocols

Racal-Vadic, Inc. introduced a 9.6K bit/sec synchronous modem reportedly capable of supporting four autodialing protocols.

The **9650PA** is designed for 2-wire dial-up applications. It includes four integrated automatic dialers, which support 801-type parallel automatic dialing protocols as well as IBM's 3270 Synchronous Data Link Control, High Level Data Link Control and 3780 Binary Synchronous Communications protocols.

Operating at 9.6K bit/sec, 7.2K bit/sec and 4.8K bit/sec, the modem features front-panel control, V.29 and V.27 ter compatibility, and diagnostics. Configuration parameters and telephone numbers are stored in nonvolatile memory.

The 9650PA costs $1,695.

Racal-Vadic, Inc., 1525 McCarthy Blvd., Milpitas, Calif. 95035 (408) 946-2227.

Opinions

Paper chase a dead end

Today's communications managers must manage their corporate networks as if they were local operating companies. Since divestiture, the complexity and scope of corporate networking has grown to include large backbone networks based on high-speed technology, inside wiring, bypass systems and a number of other technologies and services.

Like the telephone companies, many communications managers depend on reams of paperwork to support their network management efforts. There is a better way, however. Software network management systems can improve the quality of network management by tracking, allocating and managing all components of a communications system.

Typical system functions include call accounting and "billback" (billing costs back to individual departments), invoice verification, facilities management, trouble reporting, inventory control, network modeling, leased-line management, and fault identification and isolation.

No single existing system can perform all those functions in a diverse multivendor network that spans both the local and long-haul environments. Therefore, the network manager is forced to consider installing multiple systems.

Local network management packages began as call accounting packages for allocating telephone costs to individual users, departments or projects. Today, these systems typi-

Nesmith is a group manager at Network Strategies, Inc., a communications consulting firm in Fairfax, Va.

cally have excellent call accounting capabilities, but vary widely in their additional functions.

Functions for local network management systems can be divided into four categories: cost control and allocation, administrative applications, problem management and network optimization. An ideal system would integrate these four applications. Unfortunately, no such system is currently available.

Cost control and allocation include billback, invoice verification, and financial tracking and budgeting. Many users have cut costs significantly after implementing these functions.

Administrative applications include directory management, cable facility management and inventory control. Many users who formerly depended on the telephone company to provide cable management must now pay the local carrier for this service. Inventory control is important because the lead time for spare parts can be long, and knowing when to order additional spare parts can mean the difference between a system that is up and one that is down.

Problem management includes work-order management, trouble ticket management, and archiving equipment and line performance records. The level of service required in many users' networks necessitates developing procedures for handling problems and day-to-day work orders. Archived records allow network managers to identify troublesome components that should be replaced or repaired. Without such records, the recurrence of a problem often goes unnoticed.

Network optimization requires intelligent systems that can assist in determining the optimal mix of trunks, lines and services. Network managers have traditionally depended on consultants, in-house staff or service vendors to recommend the right mix. The problem is that with changes occurring every month, consultants are too expensive, in-house staff members often lack experience in network design, and vendors have a vested interest in providing as much as possible of everything they sell.

Long-haul networks require the same types of applications as do short-haul nets, plus applications that allow for real-time network management. Real-time software network management systems, used for day-to-day management of the network, offer the user network testing, fault isolation and network topology reconfiguration.

The network management capabilities associated with one vendor's network hardware, such as multiplexers, modems and switches, typically are not compatible with those of other vendors' equipment. There are some exceptions, however. Avant-Garde Computing, Inc. offers a network management system that collects data from a variety of other vendors' network equipment by placing monitoring devices throughout the network.

In addition, the system can access other vendors' network management systems through custom interfaces.

However, because such interfaces attempt to integrate many disparate pieces of network equipment, the system's functionality

IBM waves its WANs

IBM is in a period of transition. The stalwart that built its fortune on data processing has learned that an emphasis on hardware, no matter how good the profit margins, can be costly in today's communications environment. And so, in the tradition of AT&T, IBM wants to be your communications company.

Since the introduction of its Systems Network Architecture in 1974, IBM has had a strong emphasis on data communications. But in the last 14 months, especially since the introduction of the Token-Ring Network in October 1985 and Netview in May 1986, IBM has shifted from data communications to communications in multivendor environments.

IBM's communications strategy is focused on providing users with

Fleig is director of systems research for International Technology Group, a Palo Alto, Calif.-based research and consulting firm specializing in the IBM market.

sufficient connectivity and functionality within the IBM product line. It's also geared toward creating interfaces to non-IBM environments to encourage users to stay with and expand their investment in IBM's communications products. This means that for the first time, a major IBM effort in wide-area networking encompasses not only IBM-specific data communications but also non-IBM environments and telecommunications.

IBM plans to realize its wide-area communications goals at least in part through its Enterprise Marketing Program, put in place early in 1986. The program, which focuses on joint IBM-Rolm Corp. sales calls, is aimed at proving to users — particularly in the Fortune 1,000 — how good IBM is at communicating within its own product line and with non-IBM systems.

Although IBM's Enterprise program was only partly successful in 1986, the company seems intent on strengthening the program's image

in 1987 — if not the program itself.

Big Blue's approach to wide-area communications comprises three objectives. The first is to establish sufficient compatibility between the various IBM products and scenarios to create a reasonably comprehensive IBM network environment for users.

Second is to expand IBM's Enterprise Network Program beyond the conventional, hierarchical SNA data communications to telecommunications and non-IBM network environments.

Third is to develop a three-level structure with a central host/network control component; a set of interchangeable intermediate solutions for local-area networks, midrange systems and controllers; and a series of workstations that can access the company's full range of information facilities through a common end-user interface.
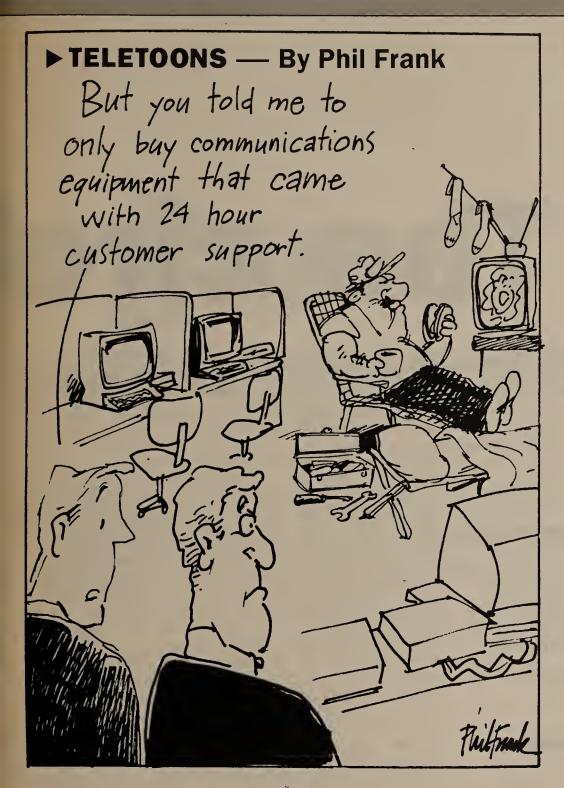
IBM is satisfying its compatibility requirements through its collection of application programmers in-

terfaces, now converged under the umbrella term, Systems Application Architecture (SAA). Together, these interfaces provide the framework for the applications that will be running on IBM systems beginning in 1987, and the interfaces will eventually serve as the migration path for applications running either independent of the network or as part of the 3270 environment.

The goal of SAA is to establish a critical mass of software applications, similar to those that exist in

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Start the new year off right and write. *Network World* is soliciting guest-penned columns for its opinions pages. Manuscripts must be letter-quality, double-spaced and approximately 600 to 750 words in length. Disk and modem submissions are preferred. Columns should be timely, controversial, literate and technically accurate. Contact Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700, ext. 584.

Opinions

But you told me to only buy communications equipment that came with 24 hour customer support.

PhilFrank

PUBLIC SAFETY COMMUNICATIONS NETWORK
VERDETTE HALL AND WALTER ULRICH

Reliability means lives

A network with more than a thousand terminals may seem complex — but think of a network with two million terminals. To add to the complexity, consider that, on any given day, perhaps as many as 1,000 of these terminals change their user identifications.

In addition, there may be five different computer systems from different manufacturers, some of which include multivendor network components such as automatic call distribution systems, two-way radio systems and mobile data terminals.

What kind of system could involve all of these complexities? The answer is the Enhanced 911 public safety communications network. A metropolitan 911 system frequently involves two million or three million telephone users, with daily changes occurring in telephone numbers and addresses.

In this network description, the term "enhanced" means that, when the user dials 911, both the calling telephone number and the caller's address are displayed on a computer terminal located at the Public Safety Answering Point (PSAP). The development and day-to-day management of this on-line data base, which associates millions of telephone numbers with their correct addresses, is in itself a major undertaking.

The design and technical support of both voice and data communications services for the PSAP are critical, since human lives often rely on the quality of the phone service and the response time.

In the design, development and implementation of Enhanced 911 systems, rapid response time and high reliability are essential. Data base management and organization must be carefully crafted to ensure accuracy while minimizing the number of steps required to access the data. The communications network must smoothly tie together each of the components, and it must be sensitive to changing traffic patterns and future requirements.

Once a telephone call has been answered and the data communi-

Hall is a telecommunications director and Ulrich is a partner with Coopers & Lybrand, managing the firm's Walter Ulrich Consulting subsidiary in Houston.

cations network has provided a corresponding address and telephone number, information describing the incident and location is forwarded to the computer-aided dispatch system. The dispatch system tracks the status of all public safety vehicles — such as police cruisers, fire trucks and ambulances — in its jurisdiction. It also provides recommendations to the radio dispatcher as to which vehicle to contact, depending on the address of the incident, type of assistance required and the availability of the nearest appropriate emergency service unit.

Whether the dispatcher agrees with the recommendation of his dispatch system or overrides it, he can radio the appropriate unit with his two-way radio communications system. In more sophisticated systems, he may simply press a transmit button and have the incident and dispatch information automatically transmitted over the radio network to a vehicle-mounted Mobile Data Terminal (MDT).

Two-way digital communications is an inherent capability of the MDT, and it serves many purposes in public safety. Its digital transmissions cannot be monitored as easily as analog voice radio signals. Furthermore, it can communicate with other computers through its interface to the dispatch computer.

For example, the MDT accesses government agency data bases to allow police officers to check license plates or driver's licenses for outstanding warrants. All states, and most major cities, maintain a central computer system containing such information. If the desired information is not found in the local computer, the police officer can also access the Federal Bureau of Investigation's National Criminal Information Center (NCIC) computer through a secondary data communications network.

Some sophisticated dispatch systems transmit street maps and building floor plans to full-screen, vehicle-mounted MDTs so that police and firefighters can determine the shortest route to the scene of an incident, or the locations of fire hydrants, building exits and hazardous materials in storage.

After the situation is under control, yet another computer,

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the System/3X and System/370 environments, in which the interface becomes the cushion between the user and the computing system. Under that scenario, questions of incompatibility among the System/36, System/38, 4300 series and a host of other processors become speculative. In 1986, IBM began providing pieces of the puzzle. In 1987, IBM will start putting the puzzle together.

Under the auspices of SAA, IBM will converge its architectures into a vertically integrated network consisting of three processor levels: host and telecommunications, a modular mid-range, and communications-oriented workstations. Overlaying the processors will be applications integration, via SAA, that will provide network transparency enabling IBM and third-party software suppliers to offer one universal end-user interface.

At the high end, the host acts as the controlling or central unit of the network with specific responsibility for network management via Netview, and traffic coordination and flow. Mid-range systems act as intelligent small systems on the network providing an intermediate

level of data storage and management, while the workstations provide user access.

The objective is to make these objectives mutually reinforcing. At the workstation level, use of the wide range of information facilities generates increased complexity and traffic driving the growth at other levels of the network. Not coincidentally, IBM hopes this pattern will spur demand for more IBM products at a time when IBM needs to see increases in its bottom line.

With broad strokes, IBM appears to be painting itself a new communications picture that replaces the static host-dominated structure of data communications with a new fluid communications environment that supports the rest of the world in data, with ASCII and International Standards Organization/Open Systems Interconnect, and in telecommunications, with Rolm's CBX, T-1, integrated services digital network, X.25 and X.400.

But, at the core, the new IBM committed to wide-area networking is really just the old IBM looking at marketing and packaging strategies to meet its lofty revenue goals. ⬚

Features

January 12, 1987

Building on PC popularity
A LAN-based data base management system offers users the independence of distributed processing with the advantages of centralized data management. A data-based LAN is less expensive to configure, use and maintain than its minicomputer and mainframe counterparts, and it offers users the freedom of running stand-alone applications.
Page one.

The circle game
A multivendor T-1 network presents special problems for network managers. When problems arise, vendors may not only blame each other, but the network manager himself. The manager can prevail by weeding out some vendors and establishing better communications channels and detailed schedules.
This page.

What do you know? Let us know. *Network World* is soliciting feature articles on voice messaging, electronic mail and international networking.

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The circl

BY NICHOLAS JOHN LIPPIS III
Special to Network World

Communications managers take heed: Implementing a T-1 network in a multivendor environment can make you feel like an irate citizen haggling with a bunch of government bureaucrats. Vendors, instead of actively dealing with problems that arise, may point the finger of blame at each other — and at you — until the project ends up going around in circles.

When multiple services, such as voice, data and video, are integrated on a T-1 facility, different internal telecommunications groups and vendors must be actively managed, and a high level of attention to detailed planning is essential to ensure the project's success.

T-1 services, offered by the regional Bell holding companies (RBHC) and by long-haul carriers, are a vehicle for integrating voice, asynchronous and synchronous

Lippis is a senior telecommunications analyst for Digital Equipment Corp. in Littleton, Mass.

> In a multivendor environment, the finger of blame points round and round.

data, and digitized video into corporate wide-area digital backbone networks. T-1 service provides the network manager with a 1.544M bit/sec binary bit stream, which he can exploit to transport a variety of networking services.

Implementation of a simple T-1 connection may involve managing as many as nine vendors. In Figure 1 , a typical voice-only T-1 facility connects two customer premises. Assuming that the users' locations are separated by local access and transport areas, a long-haul carrier will have to be selected for the inter-LATA portion of the link.

Some inter-LATA carriers will coordinate the installation and maintenance of the local T-1 access from each serving office to the end locations, maintain the circuit from end to end and provide centralized billing. Otherwise, the network manager must deal directly with one or two RBHCs as well as a long-haul carrier.
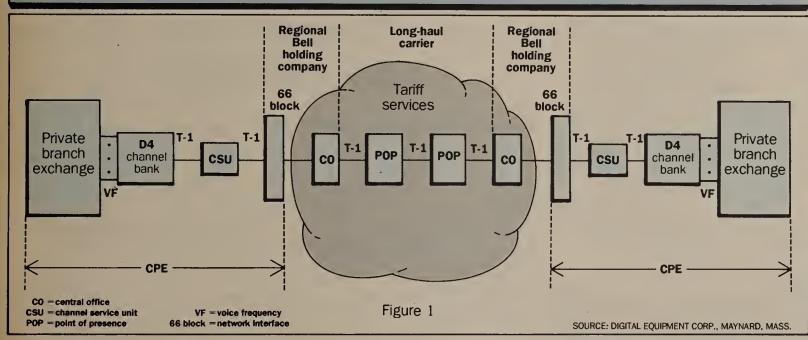
In a worst case scenario, the private branch exchanges, D4 channel banks and channel service units (CSU) on each end may all be from different vendors. Ideally, the manager should end up interacting with one PBX manufacturer, one channel bank vendor, one CSU vendor and one common carrier. If the PBX and D4 channel banks can be supplied by one manufacturer, the number of vendors can be reduced to three. It's also possible that one vendor could supply all PBXs, channel banks and CSUs, reducing the number of vendors to two. However, this is not a good idea, since the user would be putting all of his eggs in one basket and might lose some leverage with that vendor .

So far, this discussion has assumed that both PBXs are analog, but each unit can be either analog or digital. Since a D4 channel bank performs T-1 formatting and analog-to-digital voice signal encoding/decoding, if a digital PBX is selected that provides T-1 output, then the D4 channel bank can be eliminated. Again, this reduces the number of vendors, making it easier to isolate T-1 trouble.

A structured time schedule that uses checks and verifications

e game

Point-to-point voice-only T-1 connection

Figure 1

CO = central office
CSU = channel service unit
POP = point of presence
VF = voice frequency
66 block = network interface

SOURCE: DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

throughout the implementation process is imperative. Such a schedule, if structured correctly, not only ensures that cutover day will occur, but lets the network manager know days in advance if the cutover date is in jeopardy. The result is proactive, as opposed to reactive, planning.

Exploiting T-1 connectivity

To exploit the use of T-1 connectivity between ends of the network, T-1 transmission equipment, such as a T-1 multiplexer or nodal processors, must be used. Figure 2 shows how T-1 integration equipment affects the flow of network services. T-1 integration and transmission equipment is designed to integrate networking services, such as analog voice tie lines and sub-T-1 rate data and video transport, onto the wide-area digital backbone network.

A variety of T-1 integration and transmission equipment is currently available in the digital telecommunications market. This equipment fully exploits the savings that can be realized by using T-1's 1.544M bit/sec binary bit stream to replace existing services (such as 56K bit/sec Dataphone Digital Service [DDS], 9.6K bit/sec DDS or analog voice tie lines) by providing network management, network planning and a flexible network topology. By implementing an all-digital network, the user is taking an important first step toward an Integrated Services Digital Network.
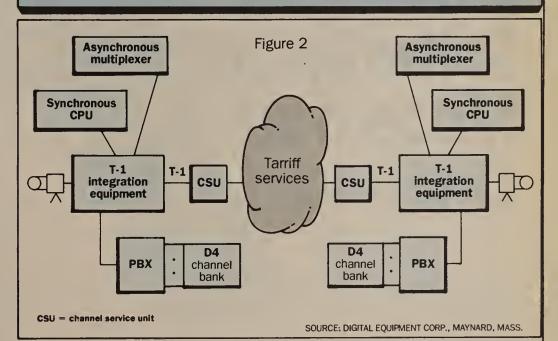
Along with the benefits outlined above, the installation of T-1 integration equipment presents the manager with some complexities. As Figure 2 depicts, the T-1 integration equipment vendor is positioned in the user's switch room between the user firm's equipment service managers on the port side and the tariff service vendors on the trunk side.

On the port side, the T-1 integration vendor and network manager face several complex issues that are changing the way they are doing business. One issue involves establishing what equipment or location demarcates the tariffed service vendor's responsibility to maintain the T-1 circuit from end to end. Also, procedures for identifying and isolating problems and coordinating restorations in the T-1 network must be incorporated into network trouble reporting procedures.

Finally, the network manager faces the task of making the introduction of T-1 transmission equipment transparent to the user firm's service managers. This is important in order to minimize internal resistance and infighting. One solution might be to appoint an integration equipment manager who acts as a liaison between the company

Integration of network services transported via T-1 integration equipment

Figure 2

CSU = channel service unit

SOURCE: DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

and external vendors, and who manages users' bandwidth needs throughout the network.

On the trunk side, the actual implementation in a multivendor environment is not much different from what was outlined in Figure 1.

Shoot down T-1 troubles

The level of troubleshooting and problem isolation available to the user on T-1 circuits is a function of the type of transmission equipment

employed.

The more sophisticated T-1 equipment, such as switches and nodal processors, support centralized network management, performance monitoring and remote troubleshooting. These network management functions will be invaluable during a T-1 installation trouble-reporting procedure, as well as during later day-to-day network troubleshooting and problem isolation. A trouble-reporting model should be composed well before implementing a T-1 service. The model will invariably go through changes as it is used.

One of the most complex problems facing the network manager in a multivendor environment is establishing trouble-reporting and problem-isolation procedures and facilitating the flow of information between vendors during network troubleshooting and problem resolution. This is most effectively negotiated within a vendor forum organized and coordinated by the network manager. After a consensus has been reached on how to delineate the maintenance responsibilities of each vendor, each basic order agreement should be reviewed and negotiated to take any new maintenance responsibilities into account.

From here, the network manager can plan a schedule of all details leading up to the actual cutover. The sidebar below provides a chronology of the T-1 implementation procedures that network managers should follow in a multivendor environment.
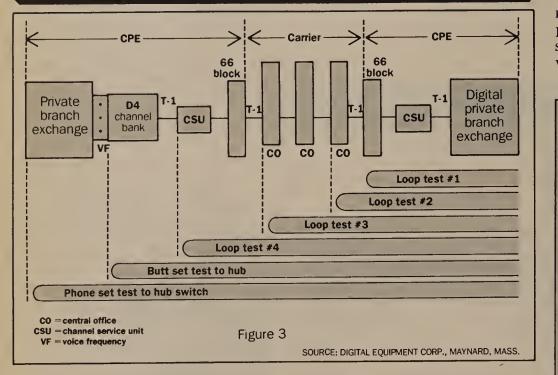
Digital Equipment Corp. has successfully planned and completed a major project in which timely and efficient installation of more than 240 T-1 circuits in Massachusetts, southern New Hampshire and other locations east of the Mississippi River was accomplished.

Since this procedure was adopted, no cutover dates have been compromised, and DEC's commercial T-1 tariff services are experiencing excellent uptime performance.

The author's acknowledgments extend to the following Digital Equipment Corp. telecommunications personnel: Warren Cohen, manager of network systems; Alan Doucet, telecommunications consultant; Carol Hynes, telecommunications analyst; and other Voice Systems Group members.

Sequence of loop-back test to be performed during the precutover test

CO = central office
CSU = channel service unit
VF = voice frequency

Figure 3

SOURCE: DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

Countdown to cutover

Without a precise and detailed plan, cutting over to a T-1 network can cause unexpected headaches in a multivendor environment. To be successful, the network manager needs a detailed implementation plan.

Before the plan can be executed, however, several preliminary steps must be taken. First, network troubleshooting and isolation procedures should be developed. Also, T-1 service and equipment orders should be issued to vendors and the common carrier. Finally, all orders and due dates should be acknowledged by the vendors.

The countdown
The countdown begins once the T-1 carrier issues an engineering release date and confirms the T-1 circuit delivery date. This should occur two weeks before the cutover date.

The manager should then freeze all due dates. Delivery of channel service units (CSU), D4 channel banks and T-1 integration equipment should be due no later than three weeks prior to cutover day. The rest of the schedule should go as follows:

Two weeks prior to cutover week
By Wednesday, the manager should determine the status of the carrier's T-1 circuit installation. If the carrier cannot meet the agreed-upon deadline, upper management should be notified. The network manager should also verify by visual inspection that all equipment, such as CSUs and D4s, is on site.

Also, if analog service is being displaced or rerouted, the network manager should issue any necessary orders for software translations for the private branch exchanges at each end.

The week before cutover
Monday: The carrier should have completed circuit installation, including connection to the network interface, and the carrier or CSU vendor should perform end-to-end circuit testing with a portable CSU. The network manager should conduct continuity and bit-rate error testing from one PBX to the network interface at the opposite end.

Wednesday: The CSU should be installed. The unit should be wired into the network interface and supporting equipment, which might include T-1 integration equipment, a PBX, a D4 channel bank, a DSX network interface or a data bridge. Also, the circuit should be tested from one PBX to the remote CSU in both hard and soft loop-back modes.

Thursday: The PBX vendor should conduct a circuit check from one PBX to the remote CSU.

Friday: If needed, the D4 vendor should install a D4 channel bank at the remote site.

Cutover week
Monday: Precutover loop-back tests should be performed by all vendors (see Figure 3). End-to-end testing should also be conducted. Circuits can be tested from end to end on either a voice or data port.

The manager should notify all users of the upcoming cutover, and warn them that brief outages may occur. Finally, vendors should resolve any system performance issues identified in the precutover test. These problems should be resolved by Thursday at 4:00 p.m. If the circuit is not at 100% by that time, the cutover must be postponed.

Friday: cutover day
At 2:00 p.m. cutover from the displaced services to T-1 services occurs. The PBX vendor informs the network manager continuously regarding the status of the cutover until the process is complete. Then, finally, the network manager can sit back and relax.
— Nicholas John Lippis III

▶ DATA BASE MANAGEMENT SYSTEMS

Building on PC popularity

A LAN-based DBMS puts new capabilities in the user toolbox.

TOM BARRETT
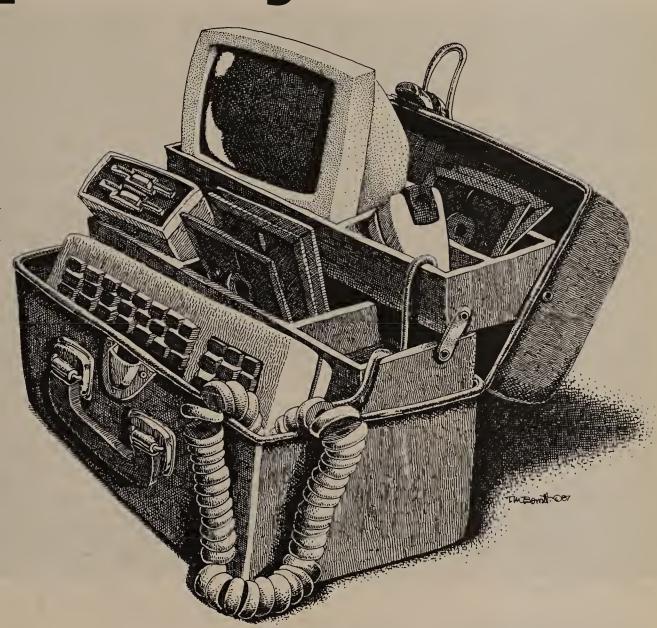
publishers — Ashton-Tate, Microrim, Inc., Data Access Corp. and others — feature compatibility with one or more local nets. This new software offers users a unique combination: centralized data management with distributed data processing.

However, the trend toward multiuser local network applications raises a number of questions for corporations considering the use of a personal computer-based DBMS. Whether to use a local net-compatible DBMS at all is the first question users should ask.

A major reason for the personal computer's popularity is its independence from centralized MIS departments. Each user can maintain complete control over a private domain of information. However, this much-cherished independence becomes a roadblock when information must be shared with other users in the department. Making the data available requires batch transfers via floppy diskettes, telephone lines or some other medium.

One advantage of using a networked DBMS is that data resides in a central network location,

Pope provides technical support and develops in-house networked data base systems at Cosmos, Inc., a data base system vendor in Bellevue, Wash.

and all personal computers in the local network have instant access to the latest version. Batch transfers are unnecessary. A less obvious benefit to centralizing data derives from the data base design principle, which says that only one copy of data should exist. Using multiple copies on personal computers is wasteful and results in unreliable data, as all files are not updated concurrently. For example, if a customer list is on two personal computers, who updates it, and how will updates be communi-

cated to the other microcomputer? Even the most rigid procedures for maintaining such a file will be inferior to a single, centralized list.

Minis and mainframes vs. LANs

Many managers who have experience with larger systems already recognize the advantages of a centralized data base. Why not bypass personal computers altogether and install a larger system, such as a departmental mini?

One reason is cost. A server-

based local-area network is still less expensive than a minicomputer, sometimes much less. Once a minicomputer is installed, adding terminals will be cheaper than adding personal computers to a local net, but a substantial number of workstations may be required before the minicomputer's expense is justified. Further, diskless personal computers will soon be available at about the same cost as a quality dumb terminal. More importantly, local network users can continue to use the stand-alone software for which they obtained their personal computer while benefiting from the local network's shared facilities.

One often overlooked advantage of a local network-based DBMS is that personal computer software will typically be easier to configure, use and maintain than software that performs the same functions on a minicomputer. The result is lower programming and system maintenance costs. The services of a professional programmer are still indispensable for a local network-based DBMS, but it is likely to be far less expensive to hire a programmer for Ashton-Tate's dBase III than for an IBM System/36.

The user's choice of network hardware and software, a DBMS and personal computers, the complexity of the application and the number of stations on the network will all impact performance.

A DBMS taxes a network more than almost any other application because of the large amount of file access required. The problem is particularly acute on a local network because the file server typically has a slower response time than a local hard disk. Although the greater processing power of larger systems would seem to favor those systems, a larger system must provide all processing for all users, while a local net distributes the processing burden to the individual workstations. The network's central computer, the file server, is dedicated to servicing file and printer requests and so has a lighter work load than its mini and mainframe counterparts.

This makes the local net-based DBMS capable of surprisingly large and complex applications. It would be ludicrous to suggest that any local-area network server is the equivalent of a more powerful mini or mainframe system, however. The more muscular servers from companies such as Novell, Inc., Banyan Systems, Inc. and 3Com Corp. can comfortably handle up to about two dozen personal computers with little degradation, but systems with more personal computers attached reflect their work load under heavy DBMS usage. Smaller networks may find themselves limited to a dozen users or less.

A variety of benchmark reports are available that rate the performance of various local-area networks in terms of their speed and network configurations. Unfortunately, it is difficult to extrapolate these results to real applications, although relative performance can be judged. In the end, the best approach is to evaluate an installed application similar to the one the user proposes. The manager's checklist should include examining the system for ease of use, response time with the desired application in place, ease of installation and quality of vendor support.

With regard to installation, the simpler and more automatic the process is, the better. Complex installation procedures invite errors

The services of a professional programmer are indispensable for a local network-based DBMS.

or omissions that can result in lost data. The less expertise the user has in-house, the more this factor ought to be a criterion for judging DBMSs.

The right system configuration depends upon the number of users in the department, the number of applications and the size of the data base. A minimum file server configuration for a two to three person network using only a DBMS would require an IBM Personal Computer AT with 640K bytes of memory and at least a 20-megabyte hard disk.

A matter of integrity

In a centralized application, a problem arises when users are editing a common file. Editing a file means copying it to random-access memory in the personal computer, changing it, then writing the new version back to the server disk over the old one. If multiple users edit the same file at the same time, they risk overwriting each other's changes.

With applications such as word processing or spreadsheets, it's sufficient to simply lock an entire document or spreadsheet so that only one person can access the file at a time.

A useful network DBMS, how-

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1
My primary areas of activity. (Circle ONE only)
I am involved in evaluating communications (data, voice and/or image) products and services:
1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both
4. Other (explain) _____

1a
For communications, my primary responsibility is: (Circle ONE only)
1. Data Communications
2. Voice Communications
3. Both
4. Other (explain) _____

2
Circle only the ONE title classification which most applies to you.
Company Management
11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CEO, VP, Dir. Head of Finance, Admin. Procurement
Communications Management
Data Communications
21. Management
VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff:
Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services
Telecommunications
31. Management
VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff: Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services
Factory Communications
41. Management
42. Supervisory/Staff
MIS/Data Processing
51. Management
VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of Systems Design, Analysis Applications
Others
75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other _____

3
Job Function
Which one of the following best describes your functional involvement with communications (data, voice, and /or video) products? (Circle ONE only)
Corporate
1. Business Management, Planning and/or Development
Communications System/Network
2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other _____

4
Which one of the following best describes the primary business activity of your organization at this location? (Circle ONE only)
Consultants
11. DP/Communications Consulting Services
12. Consulting Services (except DP/ Communications)
End Users
13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/ Construction/ Petroleum Refining/ Agriculture/ Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local
Vendors
41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, International Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other _____

5
In which ways do you typically become involved in acquiring communication products (data, voice, and/or video) and services? (Circle ALL that apply)
1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6
Check ALL that apply in columns A and B.
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

A	B	Product/Services	A	B	Product/Services
		Computers			*Transmission/Network Services Equipment*
01.☐	☐	Micros	18.☐	☐	Microwave
02.☐	☐	Minis	19.☐	☐	Satellite Earth Stations
03.☐	☐	Mainframes	20.☐	☐	Local Area Networks
34.☐	☐	Printers	21.☐	☐	Wide Area Networks
		Data Communications	22.☐	☐	Packet Switching Equipment
04.☐	☐	Communications Processors	23.☐	☐	Fiber Optic Equipment
05.☐	☐	Comm./Networks Software	36.☐	☐	T1
06.☐	☐	Digital Switching Equipment			*Communications Services*
07.☐	☐	Facsimile	24.☐	☐	Packet Switching Services
08.☐	☐	Modems	25.☐	☐	Cellular Mobile Radio Services
09.☐	☐	Multiplexers	26.☐	☐	Electronic Mail
10.☐	☐	Protocol Converters	27.☐	☐	Enhanced Services
11.☐	☐	Network Mgmt. & Control	28.☐	☐	Centrex
12.☐	☐	Test Equipment	29.☐	☐	Long Haul Services
13.☐	☐	3270 Controllers	30.☐	☐	BOC Services
35.☐	☐	Intelligent Terminals	31.☐	☐	Independent Telco Services
		Telecommunications			*Other*
14.☐	☐	PBXs	32.☐	☐	Factory Communications
15.☐	☐	Key Systems	33.☐	☐	Online Data Bases
16.☐	☐	Central Office Equipment			
17.☐	☐	Integrated Voice/Data Terminals			

7
Estimated value of communications systems, equipment and services:
A. which you helped specify, recommend or approve in *last* 12 months? (Check only ONE in column A.)
B. which you plan to specify, recommend or approve in *next* 12 months? (Check only ONE in column B.)

A	B		A	B	
1. ☐	☐	$10 million and over	6. ☐	☐	$100,000 - $249,999
2. ☐	☐	$5 million - $9.9 million	7. ☐	☐	$50,000 - $99,999
3. ☐	☐	$1 million - $4.9 million	8. ☐	☐	Under $50,000
4. ☐	☐	$500,000 - $999,999	9. ☐	☐	Don't Know
5. ☐	☐	$250,000 - $499,999			

8
Estimated gross annual revenues for your entire company/institution:
(Circle ONE only)
1. Over $1 billion
2. $500 million to $1 billion
3. $100 million to $499.9 million
4. $50 million to $99.9 million
5. $10 million to $49.9 million
6. $5 million to $9.9 million
7. under $5 million

9
Estimated number of total employees at this location:
(Circle ONE only)

1. Over 5,000	3. 500 - 999	5. 100 - 249	7. 20 - 49
2. 1,000 - 4,999	4. 250 - 499	6. 50 - 99	8. 1 - 19

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2. Answer all questions
3. Sign and date form

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THANK YOU.

NETWORK WORLD
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ever, should support record-locking, which permits multiple users into the same file, while allowing individual records in the file to be locked. Network compatibility in a DBMS means that the package can make use of the record-locking scheme offered by a particular network operating system. A DBMS without record-locking is unsafe for use on a local network.

All DBMSs for local nets offer some form of record-locking, but not all network DBMSs are created equal. In some systems, the DBMS permits multiple users to take copies of the same record and then checks for changes as the record is being written back to disk. The system then reports any differences to the user, who must OK the changes. Aside from violating the one copy rule, this can be time-consuming and frustrating.

An ideal network DBMS can make record-locking optional for certain processes. For report processing, for example, some DBMSs have a read-only access feature, which allows users to access but not change data in locked records. Without this feature, the report generator may wait to access locked records, or it may skip them, creating an inaccurate report. Record changes that are in progress while the report is being generated will not be included, however, since they have not been saved to the central data base.

Another issue surrounds auxiliary files. Updating a record might also mean making changes in related files such as indices, cross-reference files and header record files. Does a DBMS lock records individually in these files, or does it lock the entire auxiliary file? Obviously, locking records in one file while making entire secondary files unavailable will cause conflict when many users are updating records.

Other factors to be considered in choosing a local net-based DBMS are also applicable to stand-alone DBMSs. These factors include security and encryption, programmability and upward and downward compatibility.

In a local net DBMS, any network user can access centralized data. A DBMS that offers security features such as password protection or encryption may be of interest to users who wish to protect sensitive information. Some DBMSs allow individual security levels to be assigned, so that users with low security levels have either no access or read-only access to certain data, while more privileged users can change or review protected information. It's useful for security reasons to be able to store sensitive data base files separately.

Because a local-area network-based DBMS tends to be used for more complex applications, the programming power available in the package will also be of interest. A powerful application generator with a robust programming language is a must.

Finally, upward and downward compatibility — the ability to transfer an application between a local network-based DBMS and a larger mainframe or mini system —

should be considered. Many high-end DBMSs have direct cognates in the mainframe and mini world. The advantage, at least theoretically, is that an application will look the same on both the stand-alone personal computer and the mainframe. This benefits the user, who requires little or no retraining.

New capabilities

There's no question that network-compatible DBMSs have become mature enough to support serious multiuser applications. And as the base of network DBMS users grows, additional features are being added. Two enhancements of particular interest are transaction processing and communications.

Transaction processing, in which the DBMS tracks activity on the system, has trickled down from mainframes. If for some reason a transaction can't be completed — due to a hardware error or conflict in record locks, for instance — the DBMS can replay the last activity it was engaged in, even if this means undoing a partially completed transaction. The result is a high level of data integrity. For this reason, this capability is also referred to as "fault tolerance."

Another area where activity is becoming more intense is communications, specifically micro-to-mainframe links. The status quo is that data can be interchanged between micros and mainframes by copying files back and forth. Soon, though, users will have the capability to ac-

cess data interactively on larger systems from their personal computers. Interactive access permits personal computer users to read from and write to files as they normally would, while the updates take place directly on the mainframe or mini. No batch transfer is necessary.

This capability will be closely aligned with gateway technology that enables a network to link up with a different system or network. Interactive file access to larger systems from a DBMS, coupled with network gateways, will bring users the closest they've been yet to retaining centralized data storage at the departmental level while achieving true distributed processing. ▨

Chase from **page 26**

and the number of features it can offer are limited. Also, the system's interfaces can't keep up with the changes all the vendors are making.

IBM's approach, not surprisingly, is based on host processors. Different network components interface with Netview, an announced IBM product which will integrate IBM's heretofore separate network management packages. All non-Systems Network Architecture systems, including private branch exchanges, multiplexers and local-area networks, can be integrated into Netview through Netview/PC.

While this system does not differ architecturally from the Avant-Garde system, IBM's market power will make Netview a de facto standard.

Network managers responsible for managing more than 5,000 stations at one or more sites would find a software network management system useful, but unfortunately, these systems are too expensive for smaller sites.

In the long-haul environment, the network manager may need a separate, proprietary system for each vendor's equipment. In the future, however, this mix of proprietary systems will gradually evolve into a single long-haul software network management system with multiple subordinate software systems. Users would be wise to investigate the various software network management systems and to develop plans for taking advantage of their capabilities. ▱

Safety from **page 27**

known as the Records Management System (RMS), gets involved.

Typically, the system is automatically updated, through a data communications link between it and the dispatch system, with all information about a dispatch incident.

The RMS stores the information about incidents, allows management review of the responsiveness of the various departments and serves as an investigative tool for police and fire departments.

Reliability is the overriding factor that applies to all components in a public safety communications system. Common features of such systems include automatic switch-over of voice/data circuits, an automatic call distributor with dual CPUs, redundant dispatch computers, multiple radio channels with backup repeater sites and uninterruptible power supported by emergency generators.

Metropolitan areas without Enhanced 911 systems should install them. Enhanced 911 systems provide accurate addresses when the caller is unable to speak, and they speed public safety services to the scene of an emergency. They are in the public interest, and they save lives.

If a business network fails, the payroll might not get out on time. If a public safety communications network fails, people's lives may be in jeopardy. ▱

FTS from **page 2**

C. Golden.

FTS 2000 will replace the current AT&T-provided FTS, a 24-year-old analog phone system that provides voice and low-speed data communications to 1.3 million government workers. FTS currently handles about 300 million calls per year. The current system is outmoded and expensive, costing the federal government $505 million a year to operate, Golden said.

"FTS 2000 is expected to be more cost-effective because of competition in the long-distance market that is driving telephone rates down, closer to the actual cost of service," said Bernard J. Bennington, deputy commissioner of telecommunications services at the GSA.

The final RFP is virtually identical to the draft proposal issued by the GSA in November. It calls for digital voice, data and video services to be provided to the federal government over the public switched telephone network. The current FTS is a private network provided under contract by AT&T and managed by the GSA.

"By being part of the larger public network, the economies of scale will provide lower costs and increased competition, resulting in lower prices for FTS 2000 services," Golden said.

"We're contracting for services," Golden added. "We're not looking to purchase equipment or dedicated facilities. We're relying on private industry to provide us with a complete range of telecommunications services and the total operation and maintenance of FTS 2000." The GSA will not be required to make an initial capital investment. It will be billed for minutes of use of service by the prime contractor.

"Comparing the current system to the enhanced capabilities of FTS 2000, particularly in data communications, is like comparing the horse and buggy to jet planes," Golden said. The new system will support digital voice/data transmissions at speeds up to 1.544M bit/sec and slow-scan to full-motion video capability. By 1995, approximately 50% of FTS 2000 traffic will be data, Golden said. ▱

DataTransport from page 1

short of MCI's expectations in its two years of operation, and it would come as little surprise if the company dismantles the public packet net service.

DataTransport was brought to market as a public packet network service aimed at high-volume users. MCI distinguished the offering from those of traditional packet network carriers Telenet Communications Corp. and Tymnet/McDonnell Douglas Network Systems, Inc. by deploying points of presence according to individual customer needs, rather than attempting to build a global network with wide geographical distribution and a multitude of services.

MCI hoped to provide local service by interconnecting with the emerging Bell operating company packet networks. But an inhospitable regulatory environment slowed the BOCs' packet net deployment. Furthermore, end users were leery of MCI's lack of packet network expertise. DataTransport limped along with meager returns through 1985 and 1986.

Yundt said DataTransport was aimed at users that would normally build private packet nets, but that would find it more cost-effective to let MCI purchase and operate the equipment.

According to Yundt, MCI signed about six large DataTransport customers in two years, the first of which was Security Pacific National Bank, based in Los Angeles. "We were treading water for a while," Yundt said. "People liked the idea of a virtual private network, but they were skeptical about using MCI since, at the time, we had no reputation with data services. It was tough getting people to move from their existing services, even when this solution was considerably cheaper."

Security Pacific could not be reached for comment.

Audrey Mandela, senior analyst with the Boston-based Yankee Group, a research firm, said, "Users were wary of MCI's custommade approach, and things didn't develop as the company anticipated." Mandela claims MCI is looking to get out of the business.

"DataTransport was a great idea, but it never worked," said Mark Winther, director of research at New York-based Link Resources, Inc., a research and consulting concern. "They looked to their customers to drive the network deployment, but Security Pacific was one of MCI's few large customers."

Yundt declined to say exactly what MCI plans to do with the ailing service, but indicated MCI might approach the market a different way instead of exiting it entirely. "We are reconsidering whether the sale of private networks might not be preferable over a public solution," he said. "Our strategy is to provide data services that can be integrated with our voice offerings."

That strategy could come to fruition in a variety of ways. Yundt said MCI is debating the possibility of forming a strategic alliance with another vendor "in order to speed the company's entry" — presumably into the private packetswitching arena. "It is simply a question of whether we want to build these integrated services within the corporation or work with someone else," he said. ☒

Tariffs from page 2

which is what deregulation is all about. The days of cross-subsidies are over.

"For corporate users who have a critical dependence on switched services, these rate reductions are a good thing," Phillips said. "It's going to spur network usage and mitigate bypass."

The International Communications Association (ICA), a group of some of the largest telecommunications users in the country, feels the rate reductions for switched services will be beneficial to users, but worries about the pending increases in private-line costs.

"We're concerned that privateline costs are too high and should come down," said Brian Moir, attorney for ICA. "We hope the FCC investigates these private-line tariffs and proposes reductions similar to the switched-access tariffs."

Said Ray Pardo, manager of telecommunications services for Bechtel Eastern Power Corp., a subsidiary of Bechtel Corp. in Gaithersburg, Md., "These price cuts mean the telecommunications business is no longer a gold-plated industry. AT&T is no longer a monopoly and it has had to move to commodity pricing."

Bechtel Eastern has a large MCI Communications Corp. private-line network. "The AT&T rate reductions in switched service will only have a secondary effect on our telecommunications costs. The cuts will have more of an impact on our customers — state and local governments and large utility companies which rely heavily on WATS, 800 and [direct distance dialing] services."

In addition to private-line tariffs, rates for Dataphone Digital Service, Accunet T-45 and some of the Skynet offerings are also expected to increase. These special services fall under the same tariff as private-line offerings. ☒

CAREER ANNOUNCEMENTS

Calendar

**Jan. 12-13, New York —
Networking Personal Computers.**
Also, Jan. 29-30, Washington, D.C.;
March 12-13, New York; April 2-3,
Miami. Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison
Ave., New York, N.Y. 10022.

Jan. 12-13, Dallas — MVS Overview. Contact: Acts Corp., P.O. Box
180, Kingsland, Texas 78639.

**Jan. 12-14, Los Angeles — IBM
Products and Architectures.** Also,
Feb. 4-6, Chicago; Feb. 18-20, New
York; March 4-6, Phoenix; March
11-13, San Jose, Calif. Contact:
Center for Advanced Professional
Education, 1820 E. Garry St., Suite
110, Santa Ana, Calif. 92705.

**Jan. 14-16, Washington, D.C. —
Protocols for Open System Interconnection.** Contact: Continuing
Engineering Education Program,
George Washington University,
Washington, D.C. 20052.

**Jan. 14-16, Washington, D.C. —
Fiber-Optic Communications.**
Also, March 4-6, Chicago. Contact:
BCR Enterprises, Inc., 950 York
Road, Hinsdale, Ill. 60521.

**Jan. 15-16, Minneapolis —
X.25: Evaluating and Selecting Offerings and Options.** Also, Jan. 29-
30, Boston; Feb. 5-6, Atlanta; Feb.
19-20, Washington, D.C.; March 2-
3, Los Angeles; March 5-6, San Jose,
Calif. Contact: Center for Advanced Professional Education,
1820 E. Garry St., Suite 110, Santa
Ana, Calif. 92705.

**Jan. 18-21, San Antonio, Texas
— Association of College and University Telecommunications Administrators' Winter Seminar.**
Contact: Association of College and
University Telecommunications
Adminstrators, 211 Nebraska Hall,
Lincoln, Neb. 06855.

Jan. 19-21, Atlanta — SNA Concepts and Products. Contact:
American Data Group, Inc., Suite
295, 1770 Indian Trail Road, Oakbrook Plaza, Norcross, Ga. 30093.

**Jan. 19-21, New York — Data
Communications I: An Introduction to Concepts and Systems.**
Also, March 16-18, New York; Feb.
2-4, San Francisco; April 27-29, Toronto. Contact: Datapro Research
Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

**Jan. 20-21, Los Angeles — SYS-CON/'87-West: OEM Computer
Peripherals Sub-Systems Conference and Exposition.** Contact: MultiDynamics, Inc., 17100 Norwalk
Blvd., Suite 116, Cerritos, Calif.
90701.

**Jan. 20-21, Orlando, Fla. — Understanding and Selecting Voice
Messaging Systems.** Contact: BCR
Enterprises, Inc., 950 York Road,
Hinsdale, Ill. 60521.

**Jan. 22-23, Orlando, Fla. —
Maximizing the Potential of Your
Voice Messaging System.** Contact:
BCR Enterprises, Inc., 950 York
Road, Hinsdale, Ill. 60521.

**Jan. 22-23, Arlington, Va. —
BOC Regulation: 1987 and Beyond.** Contact: TeleStrategies, 1355
Beverly Road, McLean, Va. 22101.

**Jan. 28-30, New York — SNA
Architecture and Implementation
Seminar.** Contact: Communications
Solutions, Inc., 992 Saratoga-Sunnyvale Road, San Jose, Calif.
95129.

**Jan. 29-30, Boston — X.25:
Evaluating and Selecting Offerings and Options.** Also, Feb. 5-6,
Atlanta; Feb. 19-20, Washington,
D.C.; March 2-3, Los Angeles;
March 5-6, San Jose, Calif. Contact:
Center for Advanced Professional
Education, Suite 110, 1820 E. Garry
St., Santa Ana, Calif. 92705.

**Jan. 29-30, Washington, D.C. —
Packet Tech '87.** Contact: TeleStrategies, 1355 McLean Road, McLean,
Va. 22101.

**Feb. 2-6, Washington, D.C. —
Understanding Microcomputer
Data Communications: A Hands-On Approach.** Contact: Continuing
Engineering Education Program,
George Washington University,
Washington, D.C. 20052.

**Feb. 2-6, Atlanta — ACT/
VTAM for Practitioners.** Contact:
American Data Group, Inc., Suite
295, 1770 Indian Trail Road, Norcross, Ga. 33093.

Feb. 5-6, Boston — An Intensive Introduction to T1 Networking. Also, Feb. 9-10, Atlanta; Feb.
12-13, Detroit; Feb. 19-20, Princeton, N.J. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box
2429, Clifton, N.J. 07015.

**Feb. 9-11, Atlanta — Architecture and Operation of the IBM
3275.** Contact: American Data
Group, Inc., Suite 295, 1770 Indian
Trail Road, Norcross, Ga. 30093.

**Feb. 18-19, Washington, D.C. —
The International Conference on
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Conference Registrar, Phillips Publishing, Inc., 7811 Montrose Road,
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Network World Headquarters

▶ SMALL SWITCH MARKET

AT&T revises low-end strategy

In this exclusive, Gus Blanchard dispels division sale rumors.

Continued from page 1

off its roughly 2,000 strong sales staff and seek alternate distribution channels.

Blanchard did hint that GBS was considering paring its direct sales force and seeking other distribution methods in some parts of the country.

But the vice-president dismissed rumors that AT&T will sell or otherwise separate GBS from the General Markets Group. He admitted that the division is examining its past problems and has already taken some action to mold the group into a one-stop sales and service center for the under-80-line market.

GBS sells the highly successful Merlin electronic key system, the 6-month-old System 25 low-end private branch exchange and the recently introduced Electronic Key Telephone System. The group also distributes AT&T personal computers ranging from the AT&T PC 6300 to the AT&T 3B2.

"Our marketplace is essentially stale, static in terms of total buying decisions being made each year," Blanchard said. "It varies slightly based on our research, but it's basically a flat marketplace in terms of buying opportunities.

"There is an abundance of alternative distribution channels and certainly a plethora of products out there from manufacturers around the world," he said. "Although I'm relatively new to this side of the business, I've not seen anything to suggest we are not at the peak of competition right now.

"We've been taking our costs and stacking them up against the competition, and where we were not cost-effective, we have undertaken programs to deal with that," Blanchard said.

"We are in the marketplace to stay as both a sales and servicing force as well as a product development and manufacturing force. There are no plans to exit the market or to package ourselves with a big ribbon and sell us or anything else."

Blanchard heads up a work force of about 8,000 staffers, including the 2,000-member sales group, which consists of service,

Gus Blanchard

sales support, and research and development staffs.

"I have everything that would make me look like a stand-alone company except the factories," he said. "And because I have the product design requirement at the head end and the product management responsibility overall, AT&T's factories really play a role as a member of my team, although they're not on my payroll."

Ian Angus, president of Angus TeleManagement Group, Inc., a Toronto-based telecommunications consulting firm, described the under-100-line market as fiercely competitive and one in which it has become increasingly difficult to make money.

He also said vendors have to maintain a presence in this market because 90% of businesses fall into that category. "Finding more effective channels to sell the equipment is certainly something everybody wants to do," Angus said.

Contending with converging market forces has created what sources inside GBS say is a growing morale problem. Market pressures have resulted in the layoff of an undisclosed number of GBS staffers and the undertaking of a study that may prod upper management to take even more drastic steps by mid-year.

Blanchard implied that one of the things being considered in the study is the

idea of abandoning direct sales in selected markets in favor of sales through independent telephone companies, regional holding companies and resellers.

GBS already distributes Merlin through a 300-member dealer network that includes Pacific Telesis Group, Computerland Corp., Microage Computer Stores and Sears Business Systems Centers.

Blanchard said the division is looking at whether that dealer network should be expanded and who will retain responsibility for after-sale support.

He also said AT&T rental customers will see actions taken within the next few weeks that are designed to make it more "comfortable for renters."

Many of the existing and pending changes have been brought on by the narrow profit margins associated with the small systems marketplace, analysts said. Those margins are continually narrowing due to increased competition from foreign vendors and the fact that many vendors are distributing through dealers.

"I think AT&T has as many problems as Northern Telecom did in supporting a direct sales force, especially when margins are so low at that end of the market," said Greg Carlsted, an analyst with San Jose, Calif.-based DataQuest, Inc. Northern Telecom recently

retreated from the direct sales business in two regions.

But, Blanchard said, "We have no plans at all to sell either the sales or service force."

According to Michael Bobrowicz of the Stamford, Conn.-based Gartner Group, Inc., "The question is the typical one for AT&T these days: What are the number of bodies in the group, and what are the alternative sources of distribution?" He expects to see agreements announced in 1987 that would have regional holding companies distribute and service GBS products.

DataQuest's Carlsted agreed. "I think it would come as no surprise to anyone that they would withdraw, pull back or drastically reduce their efforts in selling those products through a direct sales force."

Up to now, GBS has gained its prominence in the under-100-line market through its direct sales force.

"The vast majority of sales have been through people carrying an AT&T ID card," Blanchard said.

"Our basic focus is to get our cost structure right in the voice market and be there for any customers who need our service," Blanchard said. "If there

gest that somebody else, if they were interested and willing, might be able to move more products for AT&T at a lower cost," he added.

"Our intention is to continue to be an important presence in the major markets around the country. We are in no way looking to find a way to exit this market by simply finding somebody else to sell the product.

"We believe customers recognize the value of an AT&T employee doing the selling and servicing of their electronic key system equipment needs. And as long as the customers continue to prove that assumption is right, we're going to be there with our employees."

The changes looming ahead may in fact be in response to a slight 1986 slip in market share.

"It appears GBS is going to lose a point or two in the under-100-line market share," says Glenn Powers, a senior analyst with New York-based Northern Business Information.

GBS, Powers said, still firmly holds the No. 1 position in the key system market ahead of Tie/Communications, Inc., and is a close second in the under-100-line PBX market behind Mitel, Inc., despite the System 25's youth. Powers said he

> **❝***He also said AT&T rental customers will see actions taken within the next few weeks that are designed to make it more 'comfortable for renters.'* ❞**

are some places where we simply can't do that, then, and only then, do we see ourselves looking to some other kind of supplier.

"There are some parts of the country in which AT&T has been a very small player," he continued. "That could be a territory where an independent has a very strong presence. It could be a particular locale where a reseller is well-positioned.

"There are a number of situations that could sug-

expects GBS to hold onto its leadership position in the overall under-100-line marketplace.

Upbeat about GBS's possible new directions throughout the interview, Blanchard promised, "Customers and, of course, competitors are going to start seeing, in a matter of weeks, a new and far more aggressive AT&T. There is a very aggressive GBS on the way to the marketplace."

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